ENGINEERING NEWS-RECORD

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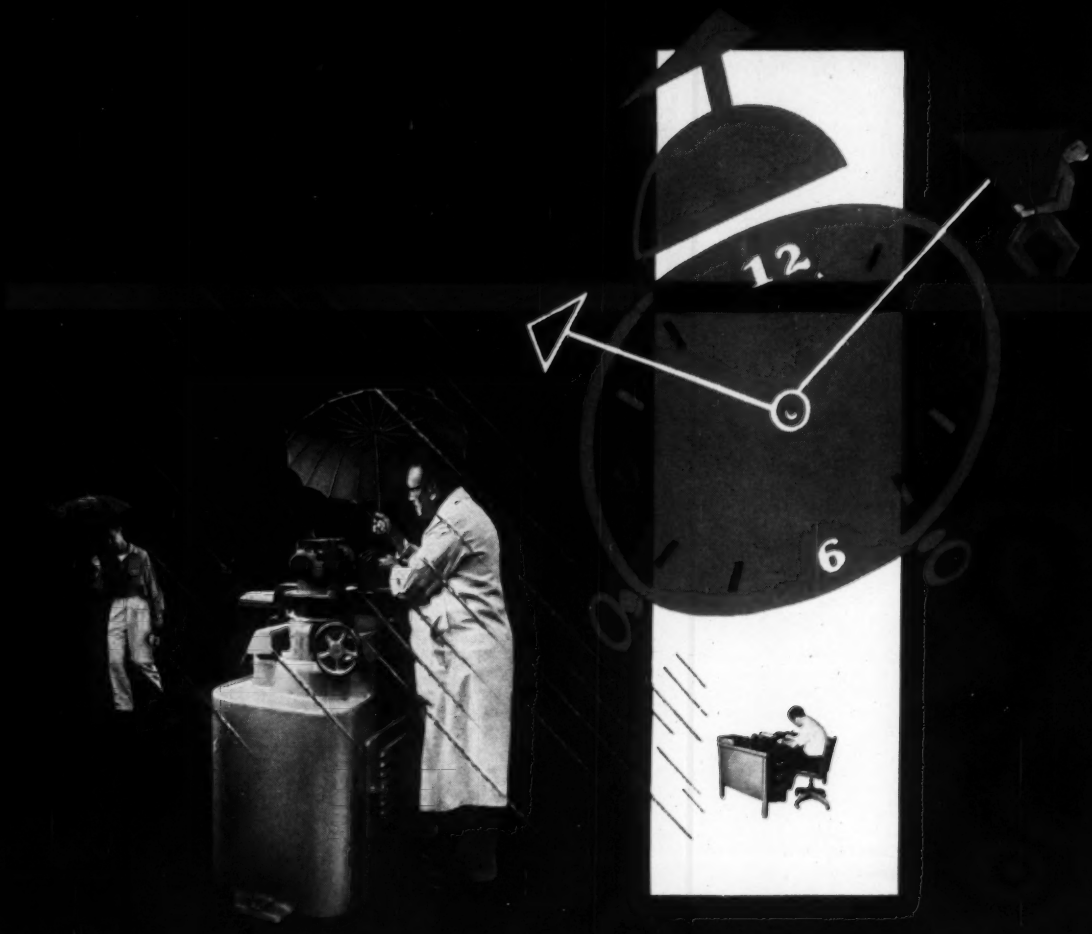
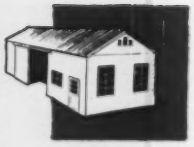


Can business wait for slow buildings?



Years ago it could! But the pace of business has changed. Consumer demand for products plus increased competition for new and expanding markets put a premium on time. Business can no longer afford costly delays for new plants and shops, expanded warehouses, offices and other space.

And, thanks to the Armco STEELOX method of construction, business can now get new buildings in days instead of months. Most of the work is done before the Armco Building reaches the customer. The 16-inch-wide STEELOX Panels are shipped ready to form the walls and roof. Special STEELOX Panel design provides both structural support and finished exterior in a single unit—saving the time and trouble of framework, rafters, sheathing and roofing.

Developing steel products to meet specific drainage and construction needs is standard practice at Armco. Another example is Corrugated Metal Pipe. Early installations indicated most of the wear came at the bottom of the pipe. So Armco designed a durable, tightly-adhering pavement and now the bottom lasts as long as the top.

Today, Armco has a complete line of engineered products, plus convenient, authoritative data to help you use them. You can bring your drainage and construction problems to Armco with full assurance that you will receive all the benefits of long experience, continuing research and a real interest in helping you solve them. Why not talk over your special or difficult problems with us now.

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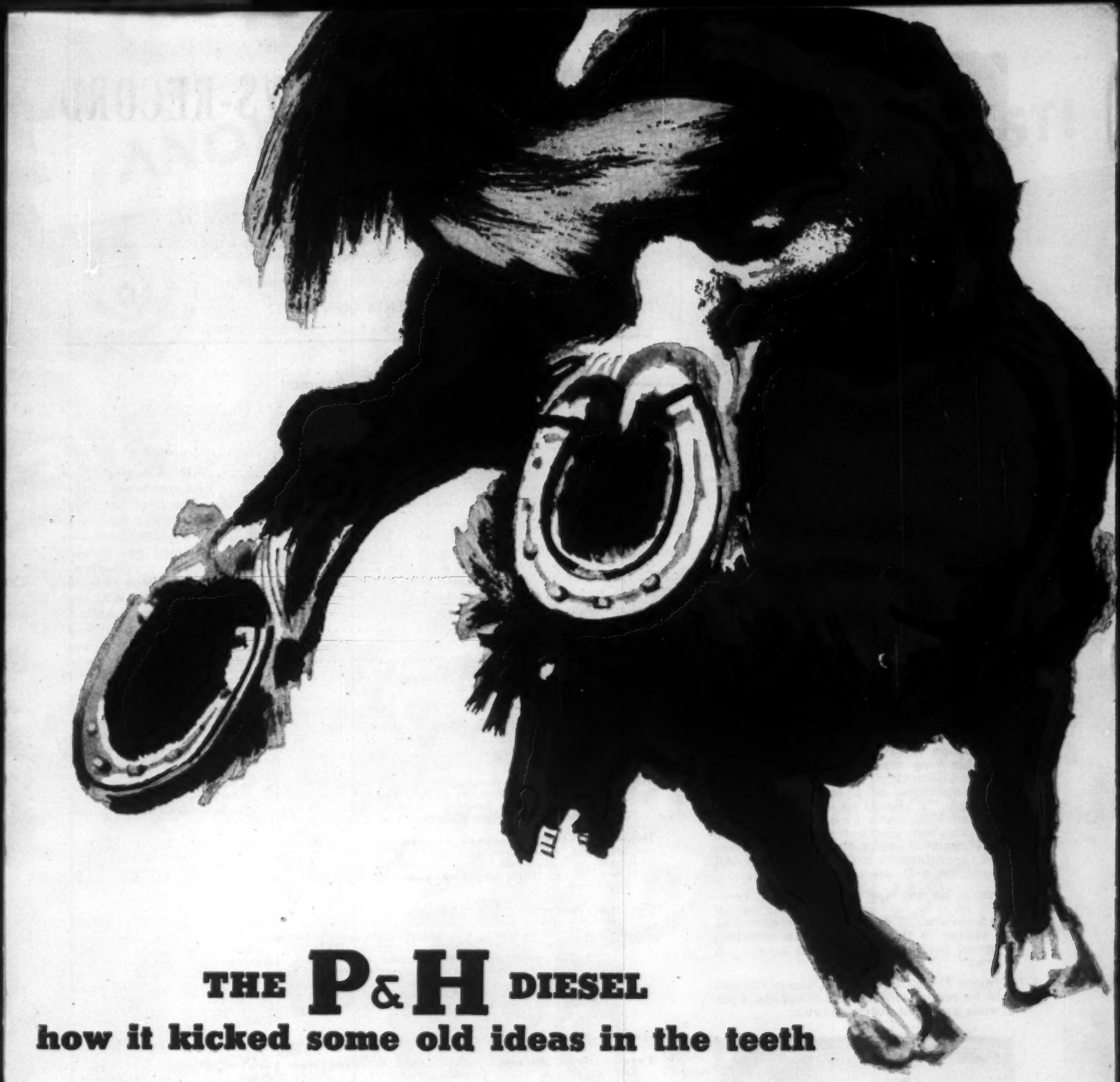
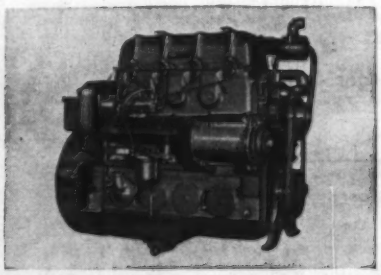


THE P&H DIESEL

how it kicked some old ideas in the teeth



Series C-18 P&H Diesels — now with *single*, fully self-contained fuel pump; perfect timing and balance for each cylinder. 30 to 255 horsepower, two-cycle. 2, 3, 4, 6-cylinder models, speeds up to 1800 r.p.m. Stationary, mobile, marine, diesel-generating sets.

Old idea: that diesels had just about reached the limit of efficiency. Then came the P&H — and a new high in horsepower per pound of engine weight.

Old idea: that diesels were costly by nature, $20.00 a horsepower and more. Then P&H drove the price down to a record low — $16.32.

Old idea: that horsepower ratings must always be tricky. P&H chose a new rating — horsepower measured right at the driveshaft, where every bit of it works for you.

The best idea, of course, is to learn *all* the ways this engine gives you more for your money. We'll be glad to send you the full story; write P&H Diesel Engine Division, Harnischfeger Corporation, Crystal Lake, Illinois.

HARNISCHFEGER

the P&H Line

9,000 square feet of Symons Forms were reused 12 times on this job. William Baumeister Construction Co., St. Paul, general contractor.

Spandrel Beam Forming Costs Cut ⅔ with Symons Forms

Because of the efficient combination of Symons forming, shoring and scaffolding methods, the contractor was able to cut his estimated cost by two-thirds on the $2,000,000 home office building of the Minnesota Mutual Life Insurance Company of St. Paul, Minnesota.

In addition to savings in labor cost, considerable time was saved in forming the Spandrel Beams of this 9-story building. The adaptability of Symons Shores with their safe "T" heads speeded the forming and scaffolding work. 2 x 8 ft. Symons Steel Rib Forms were used to frame 56,000 square feet of spandrel beams. Symons Shores were used throughout in beam construction. All foundation walls are 16 feet in height.

Symons Engineering Staff furnished complete form layouts and cost sheets for all the form work. This service was rendered at no charge to the contractor. In addition, Symons fieldmen gave regular on-the-job service.

Symons Forms, Shore and Column Clamps can be rented with purchase option. Paid rentals apply on purchase price.

View of a spandrel beam after Symons Forms have been removed.

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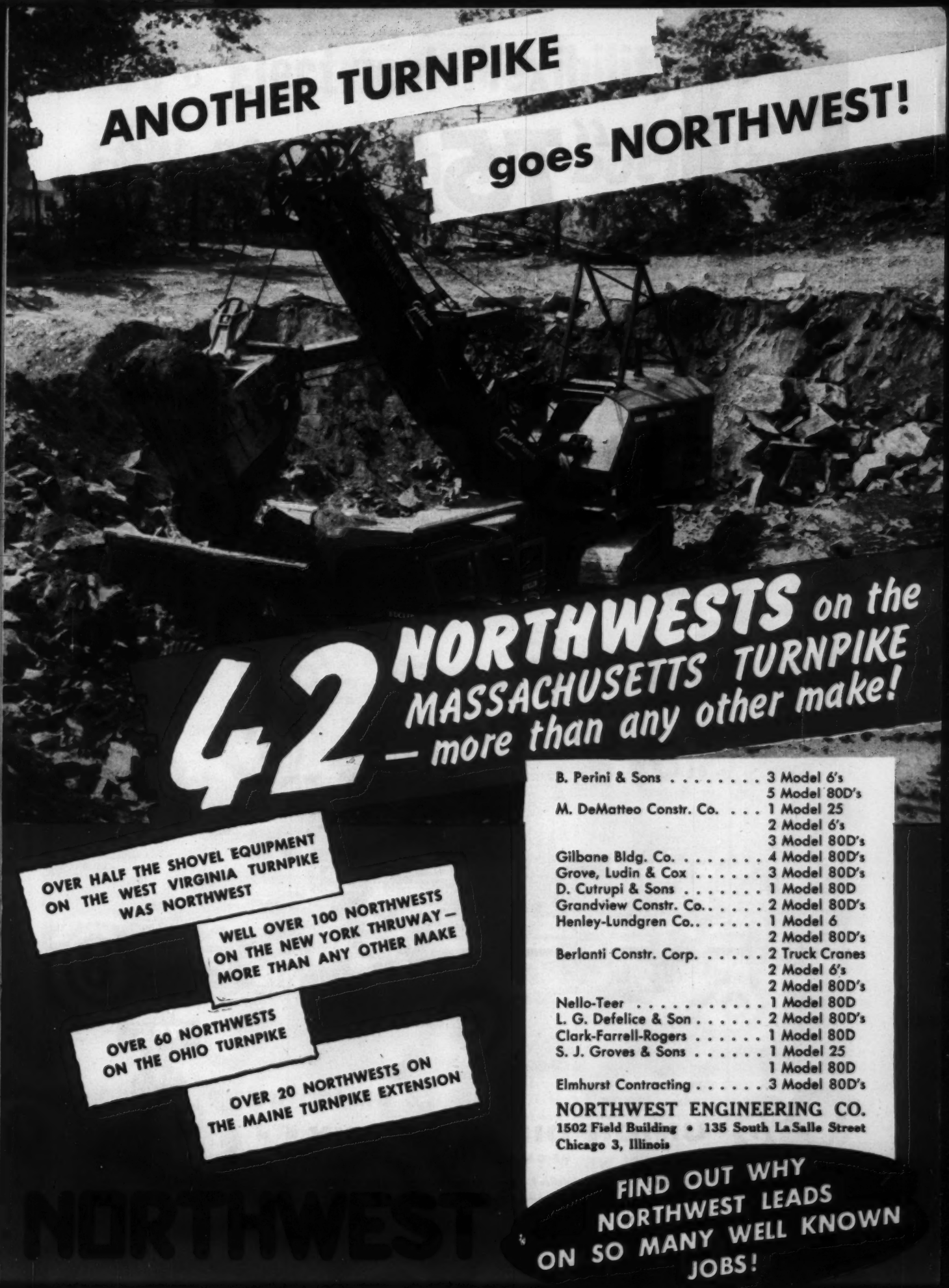
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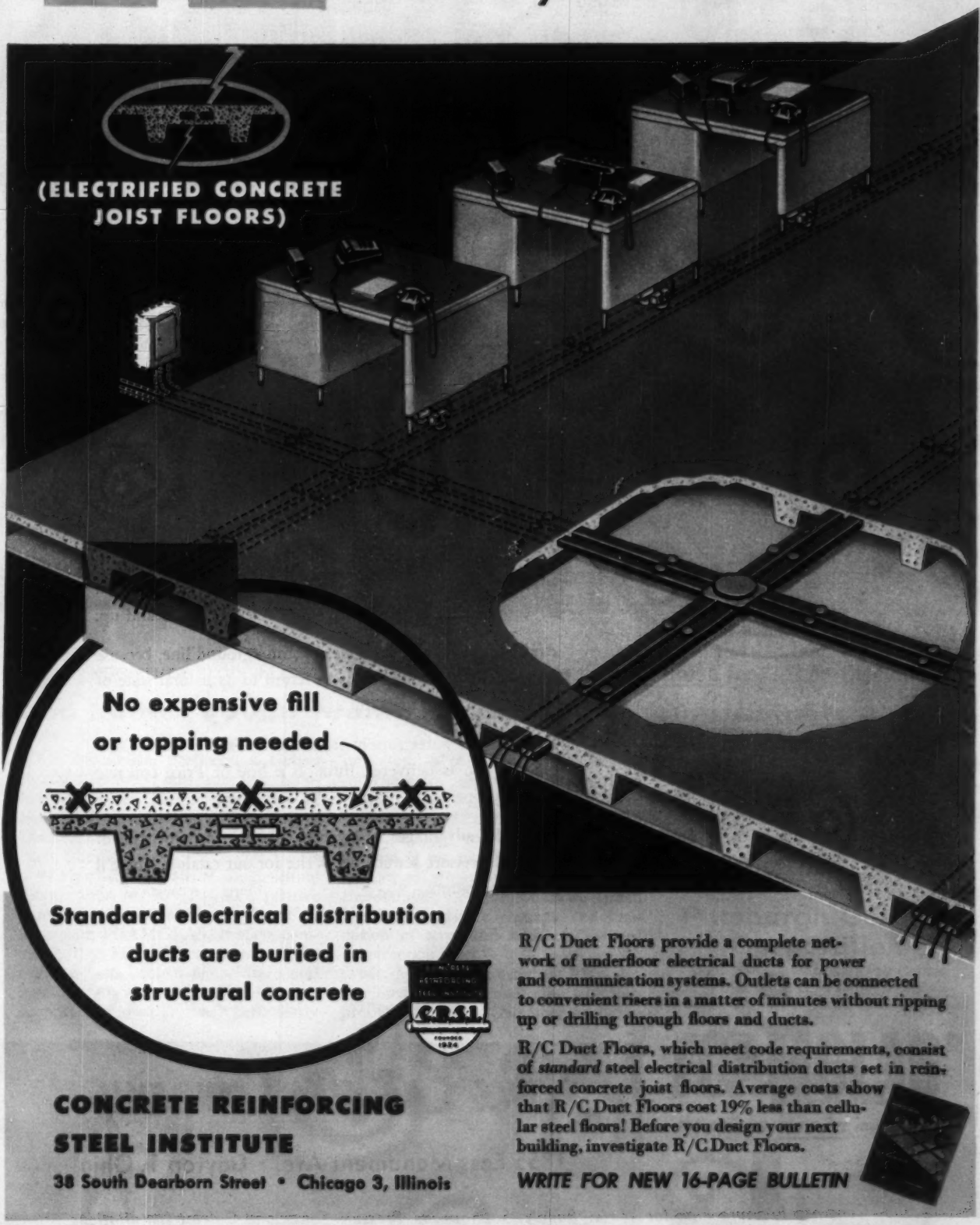
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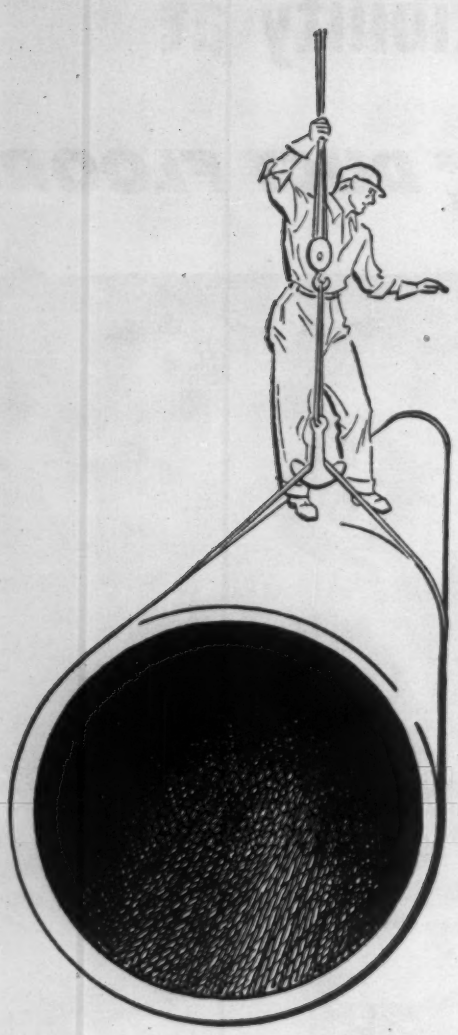

Ford Picks Concrete For Pressure Sewer Line

The Ford Motor Company has a big assembly plant in Louisville, Kentucky. Their pressure sewer system is all concrete steel-cylinder pipe. It includes 16, 20, 24, 30, 36, 42 and 48 inch Price pipe.

Price pressure pipe is good for sewer force mains because it has *flexible bottle-tight joints* and *great strength*. It can be designed for any pressure sewer line 16 inches and up.

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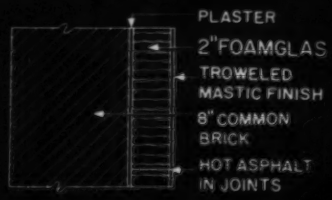

TYPICAL WALL LINING SECTION

TYPICAL COREWALL SECTION

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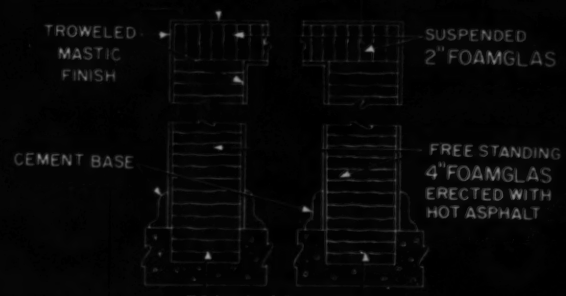
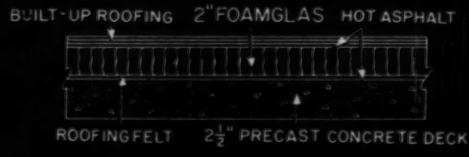
TYPICAL SECTION



ROOF
TYPICAL SECTION



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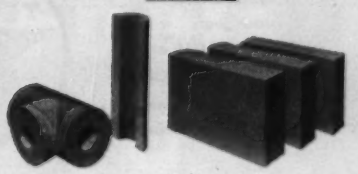

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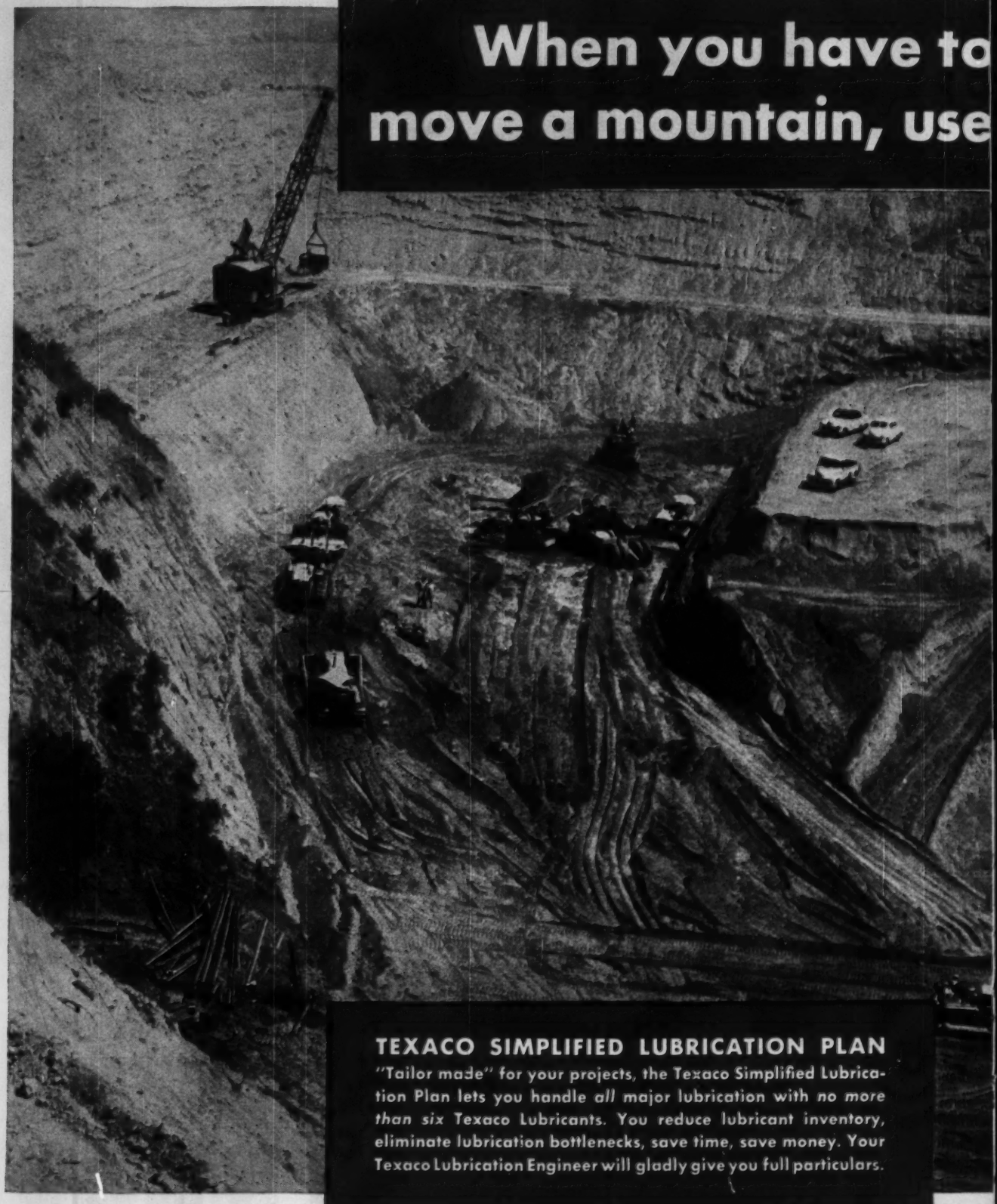

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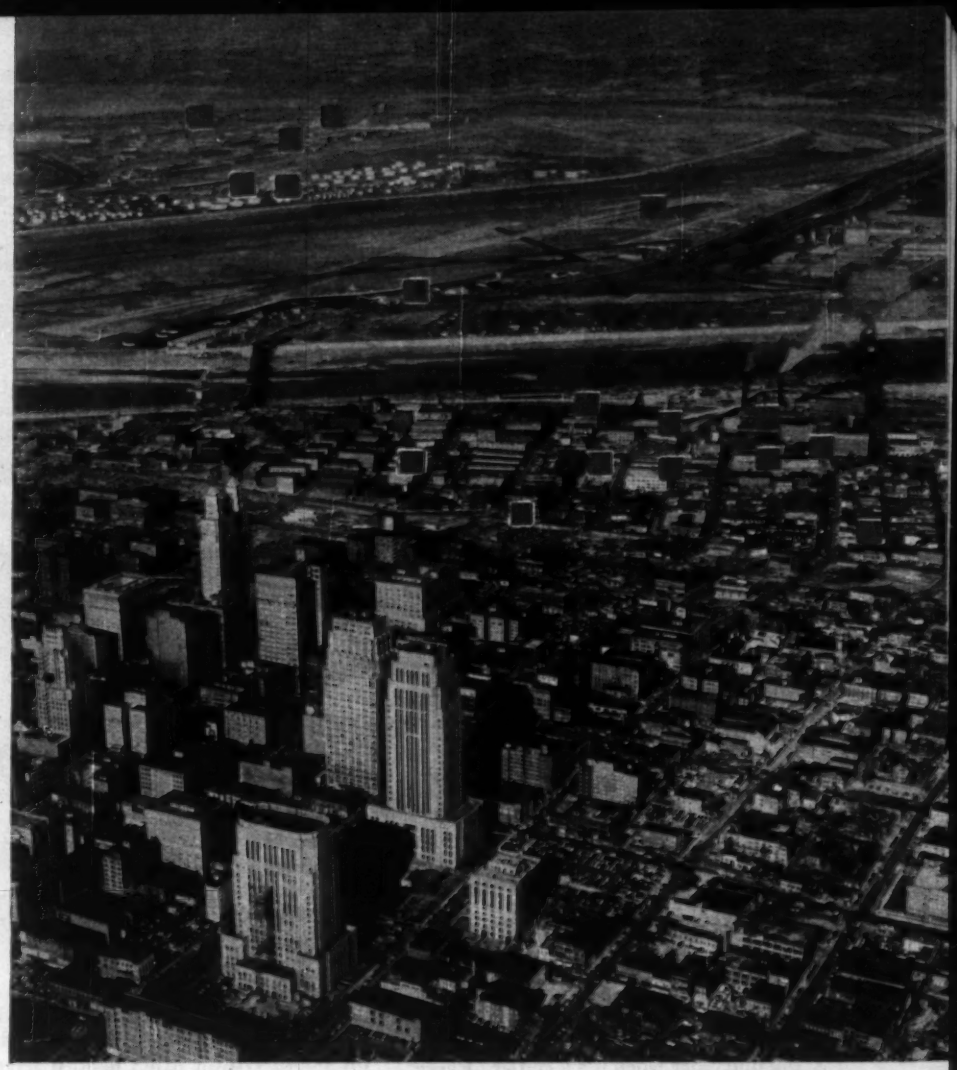

THE SQUARES INDICATE A FEW OF THE STRUCTURES ON RAYMOND FOUNDATIONS

Photo by Fairchild Aerial Surveys

130 STRUCTURES *REST ON* RAYMOND FOUNDATIONS

THE SCOPE OF RAYMOND'S ACTIVITIES...

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READER COMMENT

Law and Building Construction

SIR: I see, according to the Engineering News-Record of July 14, 1955, p. 23, that the New York District Attorney has investigated the collapse of the floor of a building under construction, and has come up with a highly technical account of just what happened and what must be done to avoid such failures in the future. (Editor's Note—See also editorial ENR July 21, 1955, p. 188.)

The detailed engineering report on the mechanics involved in the building failure almost leads one to the conclusion that only lawyers should design and supervise building construction. However, District Attorney Hogan only recommends some addendas and ammendments to the building code and the use of engineers as building inspectors. At first glance this seems harsh on the present building inspectors, but taken as a whole the recommendation neatly resolves any problem of their unemployment.

Lawyers and politicians are gradually setting up building codes with very hard and fast rules as to the planning and construction of buildings. Very soon it will not be required to have any professional judgement whatever in designing, specifying and supervising building projects—you just go by the book. On the other hand it seems that, according to Mr. Hogan, a building inspector must have professional judgement and not just merely the ability to read plans and specifications and see to it that building projects conform to them and to building code provisions. Thus, the simple switch: inspectors could become architects or engineers when and if architects and engineers become inspectors. But it may be that architects and engineers should first become lawyers in order to affirm and defend their waning professional status.

Primarily, a district attorney's job is to investigate and prosecute for criminal acts. Nevertheless, a recommendation that falsework be designed by professional engineers or architects must certainly be well-taken. Under present conditions the professional can protect his client and the public against a building failure, but he is not in a position to protect workers and contractors against their own acts. A legal requirement to fix professional responsibility for temporary structures is a good thing, but I cannot see that more than that is needed.

In a sincere attempt to serve public interests, one may manage in some measure to tie the complexities of law to the complexities of building construction. But, in a democracy, one can easily go too far in this as in other matters of public policy. There is a tyranny peculiar to a confused bureaucracy which can be pretty bad indeed.

FRANK MEMOLI
Architect
Cincinnati, Ohio

ARBA, Not AGC

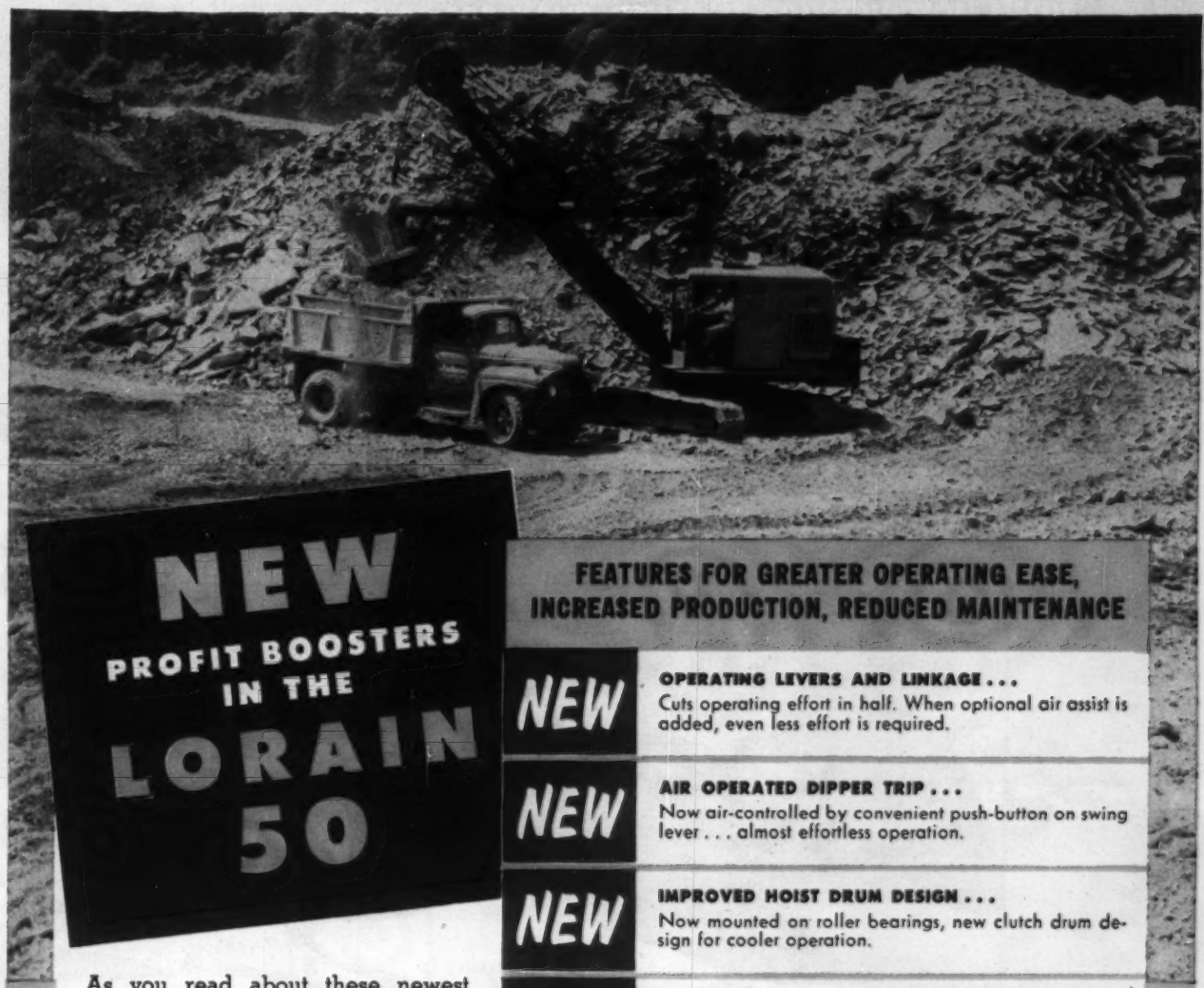
SIR: I note in your issue of July 21, 1955, that your Washington Observer reports that federal construction contracts awarded under competitive bidding will be exempt from renegotiation under the new law now clearing Congress. The column further states that the AGC has been seeking the exemption.

The amendment in question was proposed and sponsored by the Contractors Division of the American Road Builders Association and not the AGC. The writer personally attended the hearing before the Senate Finance Committee, and there was no AGC voice raised at that hearing. It is surprising that in a matter of such concern to contractors the AGC did not evidence any active interest, but an examination of the transcript of the testimony given at the hearing will show that the American Road Builders Association was the only organization sponsoring the amendment.

AUSTIN E. PAGE
Vice President
The Lane Construction Corp.
Meriden, Conn.

CALENDAR

Pennsylvania Sewage and Industrial Wastes Association, annual conference, Pennsylvania State College, Aug. 22-24.
American Society of Civil Engineers, hydraulics division, University of California, Berkeley, Calif., Aug. 24-26.
International Association for Hydraulic Research, 6th Plenary meeting, Delft, Netherlands, Aug. 29-Sept. 2.
New York Section, American Water Works Association, annual fall meeting, Saranac Inn, Saranac Inn, N. Y., Sept. 8-9.
Western Association of State Highway Officials, annual conference, Jackson Lake Lodge, Wyo., Sept. 8-10.
New England Water Works Association, Lake Placid Club, Lake Placid, N. Y., Sept. 18-22.
International Road Congress, Dolmabahce and Yildiz Palaces, Istanbul, Turkey, Sept. 26-Oct. 16.
American Public Works Association, congress and equipment show, Milwaukee, Wis., Oct. 2-5.
Federation of Sewage and Industrial Wastes Associations, Ambassador Hotel, Atlantic City, N. J., Oct. 10-13.



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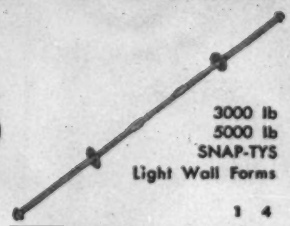


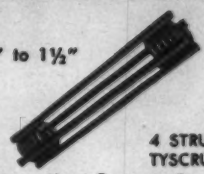
3000 lb
5000 lb
SNAP-TYS
Light Wall Forms

1 4

½" to 1½"

2 STRUT
TYSCRUS
Heavy Wall Forms

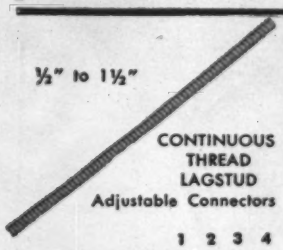
1 2 3 4



1" to 1½"

4 STRUT
TYSCRUS
Mass Concrete Forms

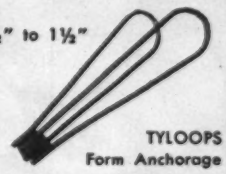
2 3



½" to 1½"

CONTINUOUS
THREAD
LAGSTUD
Adjustable Connectors

1 2 3 4



½" to 1½"

TYLOOPS
Form Anchorage

3

⅜" to 1½"

SCREW ANCHORS
AND BOLTS
Anchorage to Concrete

2 3

1¼" - 1½"

WHIRL-WIND
ANCHORS
(No Slip)
Lift Form Anchorage

¼" to ¾"

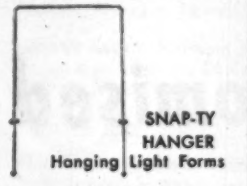
THREADED INSERTS
Fastening to Concrete

1 2 3 4

⅝" - ¾"

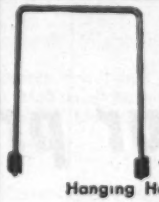
PEERLESS WEDGE INSERT
Shelf Angle Support

1



SNAP-TY
HANGER
Hanging Light Forms

1 4



½" to 1

TYHANGER
Hanging Heavy Forms

1 2 4

HANGER
FRAME SCREED
Form Hanging
and Screeding

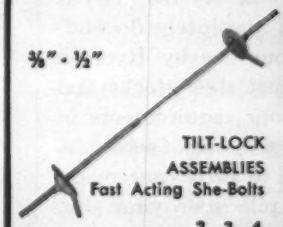
2

ADJUSTABLE
SCREED CHAIR
Screeding Slabs

1 2 4

REINFORCING
BAR SUPPORTS
Steel Support

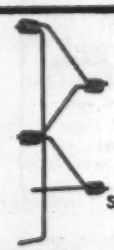
1 2 3 4



⅜" - ½"

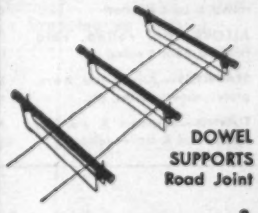
TILT-LOCK
ASSEMBLIES
Fast Acting She-Bolts

2 3 4



TYFRAME
Stadium Forms

1



DOWEL
SUPPORTS
Road Joint

2

LOAD
TRANSFER
ASSEMBLIES
Airport Slabs

2

buildings ①

roads & bridges ②

tunnels & dams ③

water & sewage PLANTS ④

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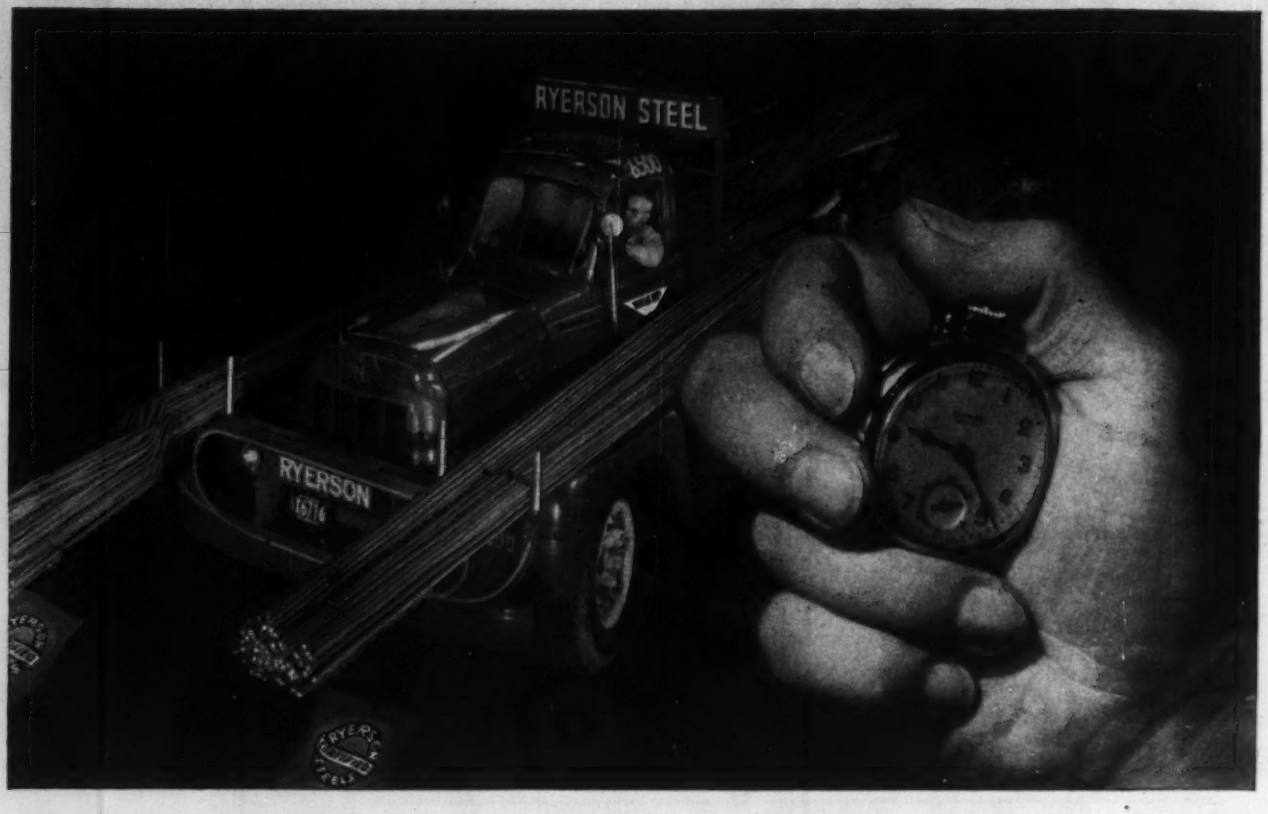

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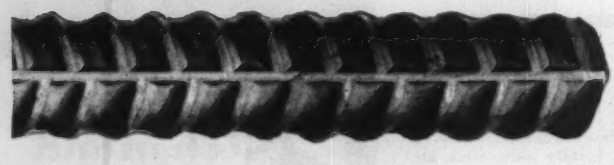

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

OUT AT SEA—While most of the nation baked in the midst of one of the hottest, driest summers on record, a small band of construction workers faced a dramatic weather problem of their own last week on a tiny, man-made island 200 miles off the Massachusetts mainland. Racing to beat the start of the hurricane season, they were pushing the legs of the first "Texas Tower" radar installation into the bed of the Atlantic so that the platform could ride safely above the waves. For a first-hand report, see page 25.

IN A WESTERN CANYON—From the nation's capitol, five men announced a $175-million construction decision on a job that will be carried out nearly three thousand miles away in the middle of Snake River where it forms part of the Oregon-Idaho border. Rejecting a plan for one high, federally built dam at the Hells Canyon site, the Federal Power Commissioners voted unanimously for construction of three low dams by Idaho Power Co. at Hells Canyon, Oxbow and Brownlee. But chances of early contract lettings appear slim; within hours after the FPC decision was announced, public power groups made it clear they will try to overturn the decision in the courts (see page 21).

NOT UNANIMOUS—Another long-standing controversy, public housing, was continued for one more year in a compromise housing bill that left some members of Congress—and the President—dissatisfied. There was little debate over major provisions of the housing bill, such as continuation of the FHA mortgage insurance program. But some new sections of the Housing Act may prove more troublesome.

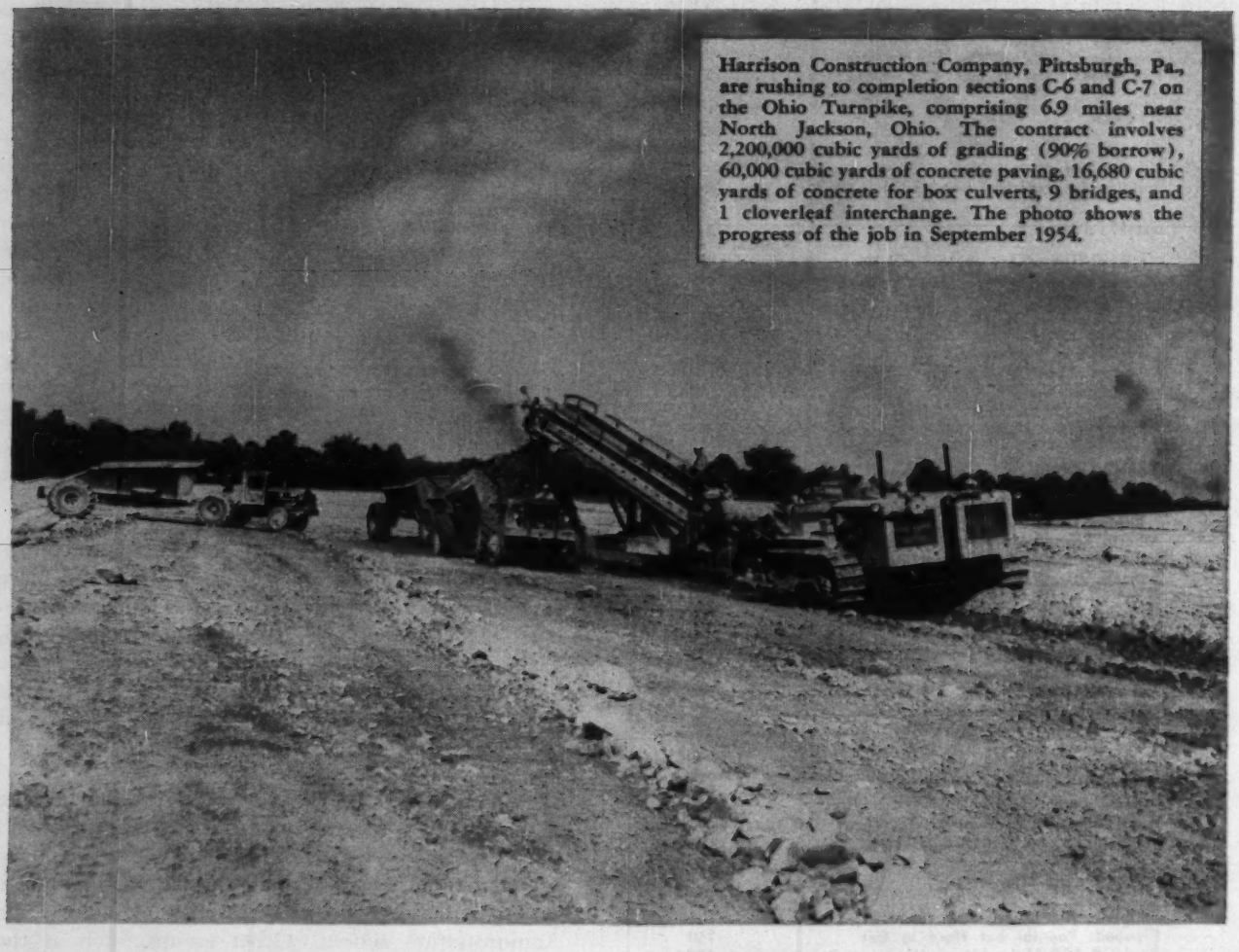
CREDIT TIGHTENING—Elsewhere on the housing scene, reaction was mixed on the Administration's moves to tighten up credit by eliminating no-down-payment home purchases and shortening the amortization periods. Lenders were quick to endorse the Administration action. Other groups, such as the National Association of Home Builders and the National Association of Real Estate Boards, were sharply critical. But some observers this week felt that part of the money that has been flowing into the mortgage market may be used now to finance other types of construction.

SELL MORE BONDS—Even without this help, public works financing has been moving at a fast clip. Last week, municipal bond sales to finance construction scored the biggest total since early June, with $112 million reported for the week. Municipal bond sales poured some $2.6 billion into construction coffers in the first 31 weeks of the year. With money available, contract awards for state and municipal construction now are running 11% ahead of last year.

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on the Ohio Turnpike Project



Harrison Construction Company, Pittsburgh, Pa., are rushing to completion sections C-6 and C-7 on the Ohio Turnpike, comprising 6.9 miles near North Jackson, Ohio. The contract involves 2,200,000 cubic yards of grading (90% borrow), 60,000 cubic yards of concrete paving, 16,680 cubic yards of concrete for box culverts, 9 bridges, and 1 cloverleaf interchange. The photo shows the progress of the job in September 1954.

THE Ohio Turnpike is another big and important project where a large percentage of the participating contractors rely on Gulf to keep their equipment on the job and operating smoothly.

Contractors like Harrison Construction Company, for example, appreciate the clean-burning, high performance properties of Gulf gasoline and Diesel fuels—also Gulf's prompt delivery service.

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WASHINGTON OBSERVER

A big construction program is being undertaken by the aluminum industry. Additions will include a completely new plant, as well as increase in capacity of present facilities. Alcoa, Reynolds and Kaiser have definite plans for expansion of their capacity, and the newcomers are renewing their interest in getting into the business.

Reynolds will build at Corpus Christie, Tex., at Lister Hill, Ala., and at a site not yet selected in the West Virginia-Kentucky area. Their goal is an increase of 135,000 tons.

Alcoa is expanding at Rockdale and Point Comfort, Tex., a total of 65,000 tons in new capacity.

Kaiser intends to build for more capacity at Tacoma, Wash., and at another site not yet selected, a total of 100,000 tons.

The first production from Anaconda's Great Falls, Mont., plant will come in this month totaling 30,000 tons. New construction will continue for another 30,000 tons.

If government decides to give assistance, three other companies also may enter the business. Olin-Mathieson is seeking a certification for fast tax write-offs for a proposed 60,000-ton plant at Morgantown, W. Va., and St. Joseph Lead seeks similar fast amortization privileges for a 66,000-ton plant at Josephtown, Pa.

Harvey Machine Co. is delaying any work on an already approved plant at The Dalles, Wash., until a federal transmission line is built in the area. Congress turned down money for the line this year.

The new round of expansion will become firmer once the Office of Defense Mobilization decides the future of fast write-off certificates. Its decision is due sometime this month. Speculation is that further tax allowances will be confined to direct defense and defense-supporting projects. Aluminum will fall into the second category.

•

New airport construction money is being pumped out as quickly as Dept. of Commerce officials can manage. There's $62.5-million in federal funds available for distribution between now and next July 1.

Allocations from the $20-million originally granted by Congress will be followed along about mid-November by allocations against the additional $42.5-million Congress OK'd for this year.

The Dept. of Commerce already showed how much states are eligible to get of the $42.5-million—and has urged local authorities to make firm plans for a four-year program.

Congress has authorized $63-million a year in federal grants for the next three years.

Entire projects, in some cases, can be planned "with assurance that federal funds will be available," Secretary Weeks points out.

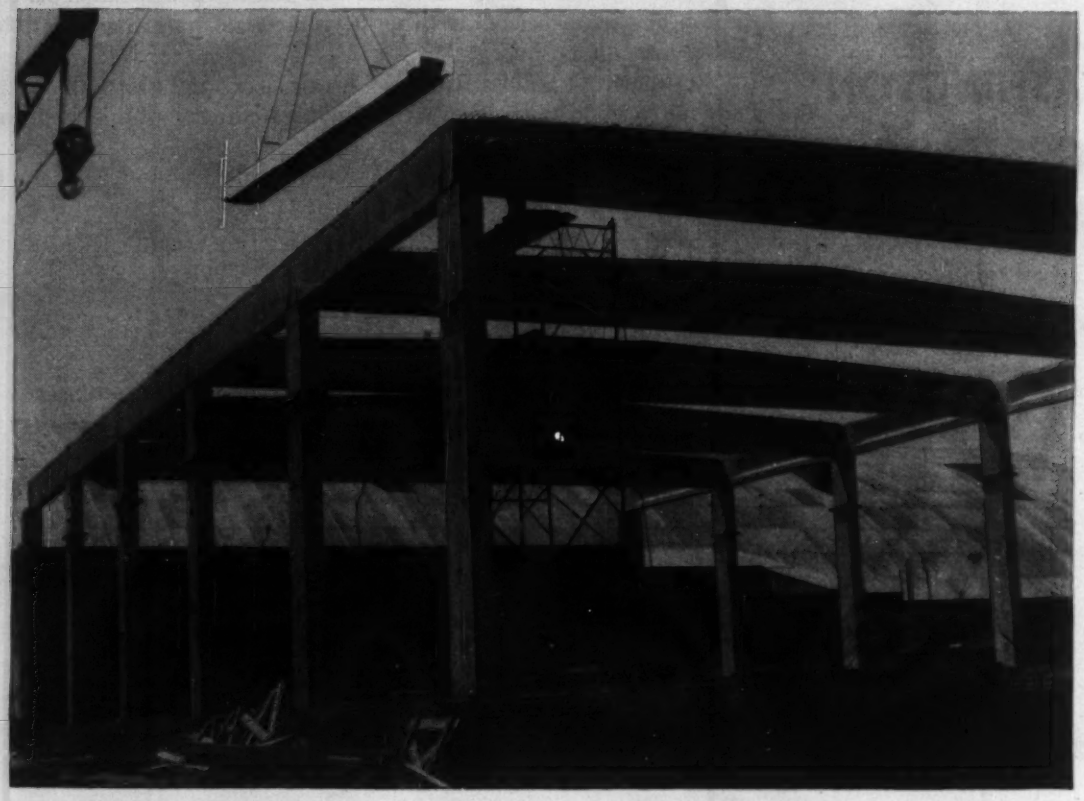
•

AFL wants an end to subsidies given to build new plants in the South. The union charges that southern communities "pirate" established companies in the North with offers of special tax deals, gifts of land, and low-paid non-union labor.

AFL leaders want Congress to investigate the problem and then do something about it.

Specifically, the AFL wants to narrow wage margins between North and South by approving things the union has long been plugging for: $1.25 minimum wage, revision of Davis-Bacon Act to require setting of minimum wages for federal contractors on a country-wide basis, rather than on the present area-by-area method.

75-FT. PRECAST, PRESTRESSED 'INCOR' CONCRETE GIRDERS USED IN UNIVERSITY OF MARYLAND SWIMMING POOL WING



PREFABRICATION... *summa cum laude*

● By making possible lighter members and longer spans, prestressing adds a new dimension to the high economy potential of precast concrete.

Precast, prestressed girders for this 75′ x 140′ Swimming Pool Wing to the Athletic Activities Building at the University of Maryland are 75′ long, 36″ deep at ends, 4′ 7″ at center, average depth-to-span ratio approximately 1:20.

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UNIVERSITY OF MARYLAND; Swimming Pool Wing

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HALL, BORDER & DONALDSON; Baltimore, Md.

Structural Engineer:
CARL HANSEN; Silver Spring, Md.

General Contractor:
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The Hells Canyon Decision

FPC approves Idaho Power Co. plan for three low dams; public power groups plan court fight against ruling

The Federal Power Commission wrote the climactic chapter last week in the long, sometimes bitter, fight over public versus private power development at Hells Canyon.

The five FPC commissioners voted unanimously to license Idaho Power Co. to undertake the $175.6-million power development by construction of three low dams within a 37-mi stretch of the Snake River where it courses through its great natural gorge to form a natural boundary between Oregon and Idaho. Sites selected for the low dams are Hells Canyon, Oxbow and Brownlee.

Public power groups, favoring one high, federally-built dam at the Hells Canyon site, quickly announced plans to fight the FPC decision in the courts.

• Construction schedule—Idaho Power Co.'s construction schedule calls for completion of the final dam nine years from the effective license date, which will be no later than Oct. 1, 1955.

Construction at the Brownlee site will begin within one year, according to the utility's timetable; three years would be required to complete the project. This dam would have a maximum height of 395 ft and a crest length of 1,320 ft. Initial power plant installation would be 360,400 kw. Ultimate capacity at Brownlee would be 540,600 kw.

Start of construction at Oxbow is scheduled to start within four years from the time Idaho Power gets its license. Completion would take two years. This dam, smaller than Brownlee, would have a maximum height of 205 ft, with a crest length of 725 ft. At Oxbow, the initial power plant installation would be 151,000 kw, and ultimately would be 226,500 kw.

Hells Canyon Dam would not be started until six years after the effective license date. This probably would coincide with completion of the Oxbow project. Maximum height of the Hells Canyon Dam would be 320 ft. Crest length would be 860 ft. In contrast, plans for a high dam at Hells Canyon called for a maximum height of 722 ft and a crest length of 1,733 ft.

Idaho Power Co.'s low dam at Hells Canyon would have an initial installed capacity of 272,000 kw and an ultimate capacity of 408,000 kw. The dam would take three years to build.

• Lengthy litigation—Idaho Power Co.'s construction schedule, however, is almost certain to hit a snag. Public power groups will try to overturn the FPC decision in favor of private development.

The National Hells Canyon Association, one of the numerous groups that intervened before FPC as an advocate of a single high dam, says it will use every means, political and legal, in fighting the license.

Legally, the association could start with a petition for a rehearing before the FPC. This petition probably would be rejected by the commission because of its unanimity on the issue. Then, within 60 days, the battle could be carried to the U. S. Circuit Court of Appeals with a request that the FPC order be modified or set aside completely. Final appeal would be to the U. S. Supreme Court.

• Power, not flood control—One thing that was dramatized by the FPC decision was the changed concept of Hells Canyon development. Almost a decade ago, the Army Corps of Engineers proposed one high dam in the Snake River, at the Hells Canyon site, to impound 3,280,000 acre-ft of water. It was to be the key project for flood control in the Columbia River Basin.

As time went by, power development at the site began to assume greater importance than flood control. That gradual change, and the influence of the Administration's "partnership policy" in developing water resources, paved the way for the Hells Canyon decision of last week.

Complete Closure of Gavins Point Dam

Dramatic night shot records closure of Army Engineers' Gavins Point Dam, near Yankton, S. D., at 4 a.m., Sunday, July 31. In contrast to Fort Randall, where a new technique of hydraulic fill was used, and Garrison, where a "race" by a walking crane to remove a plug added a touch of drama, closure at Gavins Point was considered routine. Control of the river's flow by Fort Randall Dam, 75 mi upstream from Gavins Point, removed any elements of uncertainty (ENR Mar. 31, p. 25). Smallest of the Missouri River main stem dams, Gavins Point will be used as a re-regulating dam for Fort Randall, and will provide 100,000 kw of firm power. The $18-million contract for Gavins Point was held by a combine, Western, Massman and Jones.

Construction Legislation

Wisconsin raises gas tax, creates arterial road system, regulates general contractors, approves Seaway measures

Wisconsin's legislature has recessed until Oct. 3 after clearing a wide variety of measures involving construction.

Highlighted in the session were bills calling for a 2-cent gas tax increase to provide additional road revenue, further regulation of general contractors, creation of a 2,200-mi. state arterial highway system and formation of a State Industrial Development Division.

In addition, two important projects got the green light:

• **Gov. Walter Kohler** signed the Milwaukee County expressway bill. This provides for creation of a $5-million fund to be used for purchasing vacant land that otherwise would be developed with industrial, commercial or residential buildings. The bill also empowered the commission to (1) buy, or acquire by other means, the air rights needed for structures that would carry freeways over existing building or lands; (2) order changes in grades of city and village streets and vacating streets for freeway construction.

• **The state's two houses** approved issuance of revenue bonds by Milwaukee for financing harbor improvements in connection with the St. Lawrence Seaway. Another bill gave counties the same power to come under the harbor improvement law and issue bonds for harbor or river improvements.

The gas tax boost from 4 cents to 6 cents is expected to bring in an additional $20 million a year for highway construction. Under terms of the bill, state and local units will share the funds on a 50-50 basis. The state split will amount to $10 million a year. Counties will get $3 million; towns, $3 million; villages and cities under 10,000 population, $1.5 million; cities over 10,000, $2.5 million.

The new state arterial highway system will have first call on concrete, bituminous surfacing and widening. This bill failed to pass in another form during 1953 because of legislators' desires to get areas in their districts included in the system.

The new State Industrial Development division will function in the governor's office to assist localities in attracting industrial plants. In addition to its role as clearing house for information about economy of the state and plant locations, it will function in fields of research.

A number of revisions in law affecting contractors were passed by the legislature. These deal with financial and experience statements, surety bond requirements, and contract awards.

Land surveyors also came up as a subject of the session. The legislature approved a measure requiring all land surveyors to be licensed and regulated by the state after next Jan. 31. New surveyors will be examined by a state board composed of architects and engineers.

Here is a breakdown of new legislation affecting the construction field:

● Contractors

One bill requires financial and experience statements from bidders on public works contracts in excess of $10,000 (except in Milwaukee). The law previously gave the body asking the bids authority to decide whether or not statements should be asked.

Another measure provides that all non-resident persons engaged in construction in Wisconsin as contractors or subcontractors and not otherwise regularly engaged in business in Wisconsin file a surety bond or cash with the State Department of Taxation to guarantee payment of income taxes. This bill was the result of a study revealing that only a small portion of out-of-state contractors operating within Wisconsin were paying proper income tax.

A change in present law requires that municipalities award separate contracts for plumbing, heating and ventilating, and electrical work on construction, repair, remodeling or improvement of any public building or structure.

An amendment passed by the legislature modified the law requiring listing of all subcontractors. Now, subcontractors need not be listed unless the municipality, by resolution, requires it. Municipalities also must specify what subcontracts they want listed and the type of work to be performed by each. The resolution and subcontractors to be listed must be incorporated in bidding documents.

A State Supreme Court definition of "subcontractor" also was inserted into the statutes. It states: "Subcontractor" means a person whose relationship to the principal contractor is substantially the same as to a part of work as the latter's relation is to the proprietor. A subcontractor takes a distinct part of the work in such a way that he does not contemplate doing merely personal service."

● Highways

The legislature redefined an expressway as "a divided arterial highway for through traffic with full or partial control of access and generally with grade separations at intersections."

In addition, highway legislation:

• Increased from 500 to 1,500 mi. the amount of state highways that may be designated as controlled access routes.

• Authorized the State Highway Commission to cooperate with the federal government in construction of an interstate highway system.

• Allowed some counties to use allotments for expressways instead of state trunk highways.

• Appropriated $20,000 from the state highway fund for use by the Legislative Council during 1955-1957.

● Urban Renewal

An urban renewal act designed to prevent development and spread of slum areas has been signed. It enables a municipality to plan and undertake projects to overcome slums, through such means as acquisition of real estate and installation of streets and parks. Under the act, repair or removal of buildings to prevent slums can be provided for by ordinance.

● Housing

One bill still to go to the governor would require referendums before the start of public housing projects. Another would give common councils the power to abolish a city housing authority and sell the projects it operates.

● Schools

Bills have been passed allowing the state and school districts to finance building on a self-liquidation basis through use of non-profit building corporations.

The legislature also authorized construction of a $6-million school for juvenile lawbreakers.

● Bridges

A new measure directs the State Highway Commission to confer with Michigan officials on details of a new $1-million highway bridge. The

span would cross the Menominee River to join Marinette, Wis., and Menominee, Mich.

● Condemnation

A new bill permits telephone and electric utilities to condemn and acquire property for future use in order to obtain it when prices are most favorable.

● Height Limits

The governor already has signed a bill requiring a permit from the State Aeronautics Commission for any structure or tower more than 500 ft high. The measure is aimed particularly at radio and television towers and is designed to give the commission some power to halt structures that might be a hazard to air travel.

Also, a long-standing height limitation on buildings was repealed. Formerly, the limitation was 125 ft in Milwaukee and 100 ft elsewhere.

In other action the legislature:

- Passed a bill rewriting state law on platting of land, generally requiring larger lots than in present laws.
- Approved a bill giving Wisconsin firms preference in bids for state purchases. A provision that the preference amount to 5% was cut from the bill before passage.
- Authorized cities and villages to issue bonds for construction of rubbish or garbage disposal plants.
- Approved spending $700,000 for construction of National Guard armories.

Pollution Measures

Congress approves funds to aid air research

Some $25 million worth of research into causes of air pollution will be forthcoming in the next five years as a result of Congressional action at the end of the 1955 session last week.

Similar multi-million-dollar research programs and tougher enforcement laws covering water pollution may be authorized next year.

For the next 10 months, the Public Health Service will have three times the $600,000 for research that Congress had originally appropriated for air pollution activities.

With this money, the service plans research grants on projects such as these: Using a wind tunnel to study how pollutants disperse in the air; seeing whether known amounts of various pollutants will stunt growth of living tissue cultures; developing instruments to measure auto exhaust and similar gaseous pollutants in the air.

Since one of the big handicaps to control of air pollution is the lack of trained technical personnel, the Public Health Service is scheduling short training courses for employes of state and local control groups.

The federal government will aid community groups with extensive technical and research support for air pollution abatement.

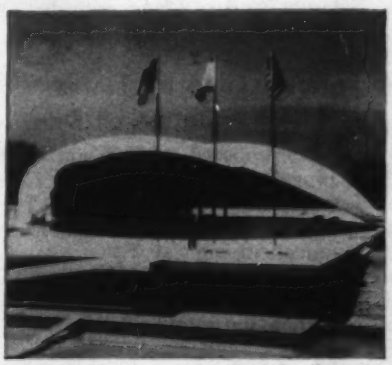
• Legislation stymied—The situation on water pollution legislation is different. An extension and broadening of the 1948 Water Pollution Control Act was caught in the House's end-of-session jam. It would have allowed last-resort court action either with the assent of the upstream state or at the request of the downstream one. Because this bill failed to pass, a $3.3-million appropriation request for research during the current year also was turned down. While passage of the bill is a good bet early in 1956, no money is likely to be allocated for use before next July.

A certain amount of research on water pollution is being carried out by the Public Health Service but officials already are planning ahead on what needs doing.

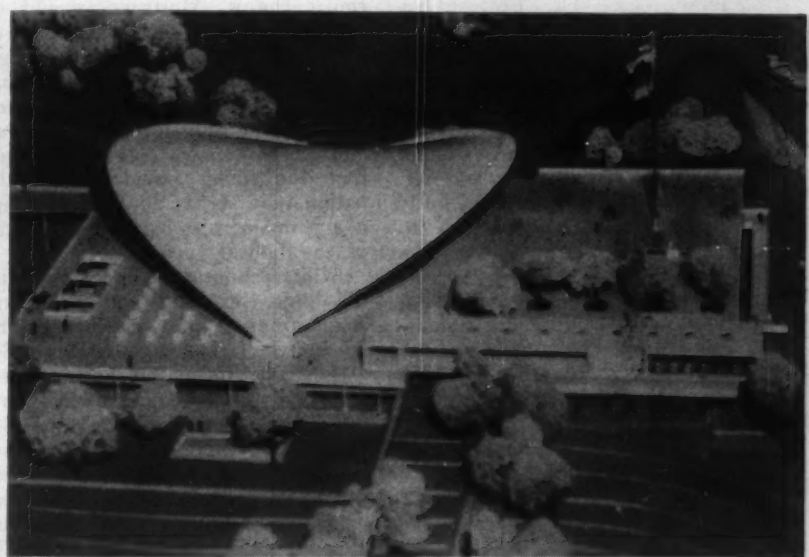
Among such items: Developing sensitive ways to measure various industrial waste components, some of which are noticeable at concentrations of less than one part in a million. Automatic recording devices are needed to warn if water contains certain types of contaminants, cyanides, for example.

Under terms of the proposed law, Public Health would be able to contract with private companies or individuals especially qualified to do such work. It also would finance research fellowships, thus training promising graduate students in the techniques and methods of pollution abatement.

This bill also would express the intent of Congress that federal installations put in needed control procedures. Even without this, there has been some progress.



Novel Roof for Berlin Hall



This ultra-modernistic $3-million International Conference Hall, designed by Hugh Stubbins, Jr., of Lexington, Mass., in consultation with a special committee of the American Institute of Architects, will be a United States gift to Berlin, Germany, part of the International Building Exhibition to be held in Berlin in 1957. Focal point of the new building is its roof, which resembles a sector of an orange peel. The roof is suspended between two arches and a compression ring surrounding the hall's auditorium, touching the floor lightly at only two points and then sweeping upward to shelter an area of 22,500 sq ft. Designed to express the American concept of freedom of speech, the hall will be located on an 11-acre landscaped site which is almost at the geographic center of Berlin, in full view of the Soviet East German sector.

Congress Votes Housing Compromise, Gives More Money to Urban Renewal

Congress voted more loan authority for the Federal Housing Administration, more funds for urban renewal and slum clearance and more starts for public housing in a compromise housing bill passed in the closing hours of this session.

Although reluctant to accept some provisions of the bill, the President was ready to sign the measure this week. While the final version of the bill gave the President a little more public housing than he had requested, there were two provisions he did not like. One deals with loans for construction of trailer camp facilities; the other provides facility loans for small communities.

Since most of the extensions are for one year, some of the controversial issues are certain to come up again in the next session. Here, in brief, is what the bill provides:

Home improvement loans—Congress extended the FHA loan guarantee program for home improvement loans to Sept. 30, 1956. But the conference committee refused to adopt provisions raising the loan guarantee ceiling from $2,500 to $3,000.

FHA mortgage insurance—The final version of the bill added $4 billion in mortgage insurance authority to the amount remaining uncommitted as of June 30, 1955. This brings the total committed under the FHA guarantee program to about $27.5 billion.

"Fannie Mae"—The Federal National Mortgage Association was authorized to enter into advance commitments totaling not more than $50 million outstanding at any one time to buy co-operative housing mortgages insured by FHA under Sec. 213 of the National Housing Act.

Defense housing and community facilities—FHA was authorized to grant mortgage insurance for any defense housing project that had Presidential approval before Aug. 1, 1955.

Slum clearance and urban renewal—The capitalization for this program was boosted by $500 million for fiscal '56 and '57. Of this amount, $100 million will be made available for slum clearance and urban renewal only at the discretion of the President.

Public housing—The conference committee agreed on 45,000 public housing starts this year. That compares with 29,500 starts actually committed in the fiscal year just ended, out of 35,000 starts authorized. The commitments fell short of the authorization because of a requirement that public housing could only be certified for those persons displaced by slum clearance projects. This provision was enforced rigidly in the beginning, and only 1,000 starts were approved up to May 1, 1955. Then the program was relaxed, and another 28,500 commitments were approved before the end of the fiscal year. In this year's bill, the tie between slum clearance and public housing has been cut and funds have been voted for 35,000 starts.

Home Loan Bank Board—The Home Loan Bank Board has been removed from the Housing and Home Finance Agency and established as an independent agency to be known as the Federal Home Loan Bank Board.

Public facility loans—One section not approved by the Administration was set up to help municipalities of less than 10,000 population finance the construction of basic works such as sewer facilities, gas distribution systems, water works and the like. In effect it continues the public agency loan program conducted by the old Reconstruction Finance Corp. It would authorize direct loans from the Treasury, which would become a part of public debt. The Administration is not convinced the program is needed, and may use this section sparingly.

Trailer park loans—The Administration also is opposed to a section that would permit FHA to insure loans for constructing water, electricity and sewerage facilities for trailer camps. Mortgages would be limited to $1,000 per trailer space or a total of $300,000 per mortgage. The Administration contends that the FHA program should be limited to actual housing loans but proponents of the trailer park loans argue that the trailer population of the nation now stands at 2,000,000 and is a permanent and growing segment of the housing economy.

Military housing—The compromise bill limited participation in Wherry Act housing to units certified by the Secretary of Defense by June 30, 1955. But the rental housing program for the Atomic Energy Commission was extended to June 30, 1956. All commitments after that date will be affected by a new amendment that prevents builders from managing and operating the housing after construction. Instead, the military would take over the project as soon as completed, provide quarters for military personnel and use the military housing allowances to retire the mortgage. Individual loans under the Wherry Act program would be increased from $5 million to $12.5 million.

College housing—Congress increased from $300 million to $500 million the total amount of obligations that can be issued to the Treasury and be outstanding at any one time. The interest rate also was lowered on these college housing loans.

Farm housing—Congress continued the farm housing program for another year, but set a limit of $100 million on Treasury loans for this purpose.

Plans Under Way in Florida For Road, Bridge Projects

Florida is planning two multi-million-dollar highways to help ease the traffic burden in the Miami area. A third new project involves construction of highway bridges at Sarasota and The Keys.

One highway project, now before Dade County commissioners, would run down the center of Miami's Biscayne Bay to connect the Florida Turnpike with the proposed new causeway to Key Largo.

The second road project involves construction of a new 6-lane highway into Miami from Dania, about 14 miles to the north. State Road Board plans call for the highway to parallel U.S. 1 about one mile to the east, and to cut through the site of the $100-million Miami International Cultural and Trade Center.

In addition, the State Road Board has approved a $5.5-million bond issue for construction of a 4-lane bridge to replace the Ringling Causeway at Sarasota, and a 3-lane span between Lido and Siesta Keys.

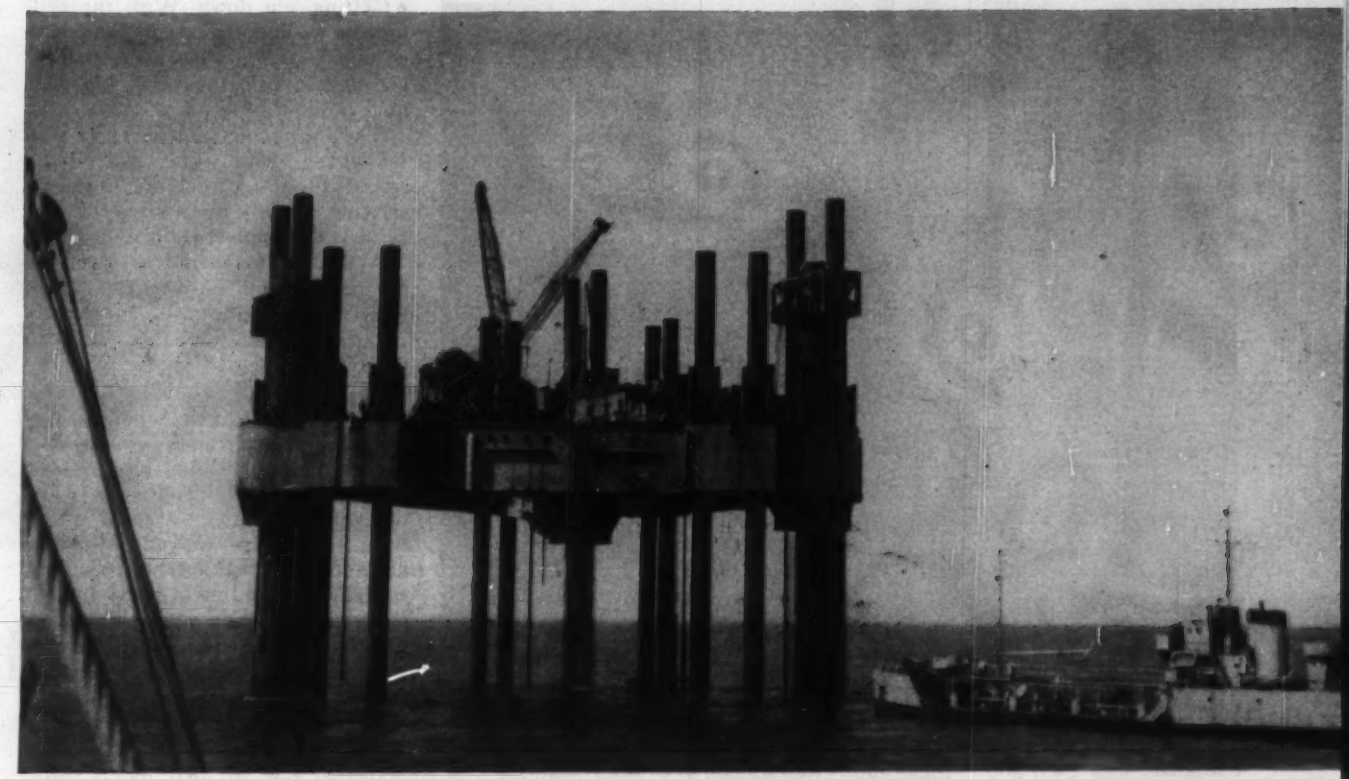
Protests Filed by Towns Hold Up Progress on Dam

The proposed $27-million hydroelectric dam at Windsor Locks, Conn., has received a five-month setback.

Electric Power Co., subsidiary of Connecticut Light & Power Co., now plans to conduct a five-month survey to determine what water or land damage might be caused by backwater of the dam.

The decision to study possibilities of water damage came as a result of protests made by Massacusetts communities along the Connecticut River. The municipalities filed the protests with the Federal Power Commission, claiming the increased water level would be a costly burden because sewer outlets would have to be relocated.

Since the power company would be liable for damages to property by backwater, the survey may show that damage costs would be too great to continue with the project.



RUSHING TO BEAT HURRICANE SEASON, which starts in mid-August, builders this week are putting permanent footing under "Texas Tower" off New England Coast. Top deck is height of eight-story building above water.

Prefabricated Island Rises Out of the Sea

E. E. Halmos, Jr.
Managing Editor

Standing stark and somehow completely improbably above the empty green expanse of the North Atlantic Ocean, about 200 mi off the Massachusetts mainland, the first link in the U.S. chain of seaward radar defense is already more than half completed.

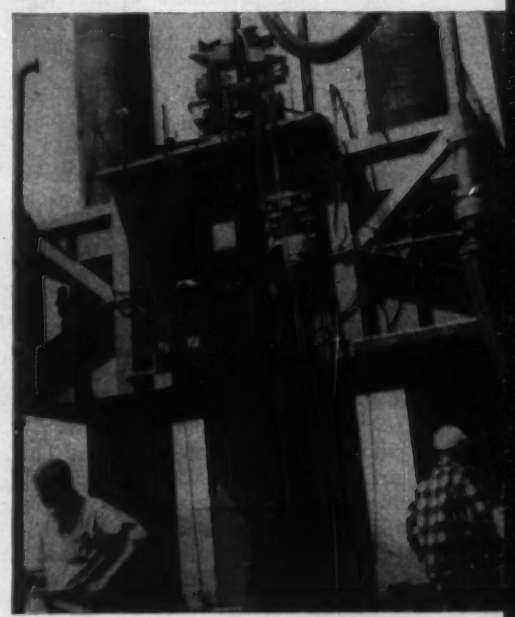
This is the popularly-named "Texas Tower," a fixed, man-made island of steel that will become a regular Air Force installation, housing radar and other equipment to detect the approach of enemy aircraft before it can reach mainland installations. The tower off the Massachusetts Coast is the first of five that will be erected to form, with floating stations, a net along the Atlantic Seaboard (ENR Oct. 14, 1954, p. 38).

Construction men often deprecate their jobs. But they aren't doing it this time. The 100-odd skilled workmen employed by the joint venture of Raymond Concrete Pile Co. and Delong Corp., and the civilian and military engineers—even the cooks and waiters employed by outside caterers—are proud of their connection with a job that is the first of its kind in the world and is therefore a source of major interest both to laymen and technicians.

• **Prefabricated island**—The main construction component of the Texas Tower is in fact a tremendous steel barge in the form of an equilateral triangle 200 ft on a side, that is towed out to position at sea, drops 6-ft dia temporary pipe-legs to the bottom and then stands erect on them like some huge water bug while its 10-ft dia permanent pipe-legs are put down to deep bearing.

The barge itself, as fabricated ashore by Bethlehem Steel Co. at its Quincy, Mass., yards, measures 20 ft deep from its bottom plates to the top deck, and is divided by steel decking horizontally to form two 10-ft floors. A third story is now being erected over about half of the top deck, to house administrative offices and technical facilities for the radar installations. Huge rubber bubbles housing the scanners will rise from the top of this third "story." The lower two decks will provide complete facilities for a permanent complement of up to 75 men, as well as boilers for heating and water distillation; fuel storage; air conditioning; generation of electrical power and the like.

Much of this interior construction



STEEL YOKE connects permanent leg to jacks that transfer weight to deck, supports jetting rig as contractor forces 10-ft permanent support into ocean bottom.

—including asphalt tile floors for galley and crew quarters and initial painting—was done at an outfitting dock at Quincy.

At the same time, twelve 6-ft dia

TOP DECK OF PLATFORM seen here in fitting yard before being towed out to sea, forms a constricted platform for construction operations. Upper story at right will support radomes to be erected at site.

temporary legs—each 200 ft high—and three permanent caissons each 10 ft in diameter and 165 ft high, were installed in their wells near the three corners of the barge, patented Delong jacks attached, and the barge readied for sea. Extensions 30 ft long for the permanent caisson legs also were stowed aboard. Thus readied, the barge weighed about 6,000 tons.

• **Long tow, short rise**—The 200-mi tow from the Quincy docks took less time than expected—two days, exactly.

From arrival of the triangular barge on the afternoon of July 14, construction has moved ahead rapidly. Here's the sequence, according to H. C. Duncan, project manager:

After careful positioning, the barge immediately released the jacks holding up the 6-ft dia temporary legs, dropping them through 50 ft of water to the ocean floor and began jacking itself clear of the water. The air-activated Delong jacks—working almost exactly on the principle used by a small boy "shinnying" up a pole—are controlled by a central panel board, and operate simultaneously.

Since the barge—afloat—drew about 12 ft of water, it was first raised to a height of about 13 ft, one foot clear of the waves. At this point, the 10-ft dia permanent caissons were dropped to the bottom to relieve the platform of their combined weight of more than 1,000 tons, and jacking continued.

Final height of the platform—the bottom deck 63 ft above mean water—was reached in two days, and construction operations started at once.

• **Construction**—Principal feature of the tower will be the three huge permanent legs on which the structure will stand. Of 2-in. thick steel plate they will be 195 ft long, with the 30-ft extensions attached.

The lower 48 ft of these caissons is encased in a second caisson (called by Duncan and all others on the project a "can") 15 ft in diameter, tapered inward at its lower edge to meet the 10-ft dia caisson and thus form a cutting edge. Space between the "can" and the inner caisson was filled with concrete when the big tube was dropped into the water, and through the space—with their nozzles directed to the water—are threaded a series of jets through which air and water are pumped to lubricate the outer skin as it sinks into the sand.

Once sunk to its full depth of 48 ft below the hard-packed sand that forms the ocean floor, the bottom 40 ft of the 10-ft caisson will be filled with concrete when the big caisson will be slipped inside, and the remaining height of the big "leg" concreted around the inner tube.

Left open, this inner tube will serve as a passageway for piping, such as fuel lines, fresh water lines, waste and the like, and as an inspection gallery for maintenance. Supply ships will attach their hoses to outlets for fuel and water in the legs.

The toal of 1,730 cu yd of concrete that will go into the legs will be placed by the intrusion method.

• **Getting 'em down**—With the platform now supported on its temporary legs, first attention has been given to getting the permanent supports into final position.

They are being sunk into the sand by jetting, with a rig that rotates around the inside edge of the caisson carrying the jets in two 180-deg arcs to make a complete circle.

With bottom sand put in suspension by the powerful jet, a suction pump hung on the same traveling rig sucks up the material and discharges it overside.

• **Other features**—The big permanent legs will be protected from contact with ships and floating objects by a specially designed fendering system that will float on rings up and down the legs. The system will consist, basically, of a circular flotation chamber, surrounded by a ring of heavy timbers that will bear on a set of rubber bumpers placed to take any strain in shear, so as to dissipate the force before it reaches the leg itself.

The location—known to fishermen as George's Bank—is the center of a perpetual tide rip that moves clockwise around the tower each 24 hours, setting up a swiftly changing current of about 4 knots per hour. It is not contemplated therefore, that the tower will ever actually dock a ship.

• **Life above the seas**—As a construction job, the Texas Tower is an unusual one for the workmen.

In the constricted space available it is possible to operate only two heavy-duty crawler cranes (equipped with cabs well up on their booms for working over the side of the tower).

Also on the deck is an aggregate bin and two mixers for the intrusion concrete; six heavy-duty air compressors for the Delong jacks; 12 compressors for arc-welding; generators supply power for the jetting and exhaust pumps and for lighting and (initially) all the construction supplies.

The men employed by Raymond-Delong work two full 12-hour shifts, seven days each week. The contractor has gone to great lengths to provide excellent meals and messing facilities, and what entertainment he can.

• **Personnel**—Operating the job for the joint venture is George Tait, a Delong Vice President, who serves as project manager. Gordon Fletcher of the Raymond Co. is a member of the operating committee; J. D. Bush, Jr. is construction manager and George Bauer is construction superintendent.

Comdr. J. J. Albers of the Navy's Civil Engineer Corps, is project officer for the Department of Defense.

Here's how the Denton Construction Co. of Detroit protects heavy road-building equipment with VISQUEEN *film.*

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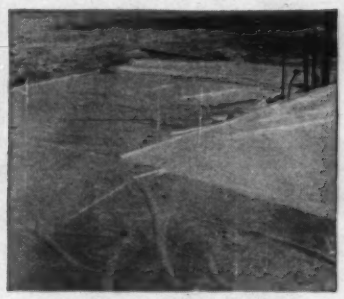

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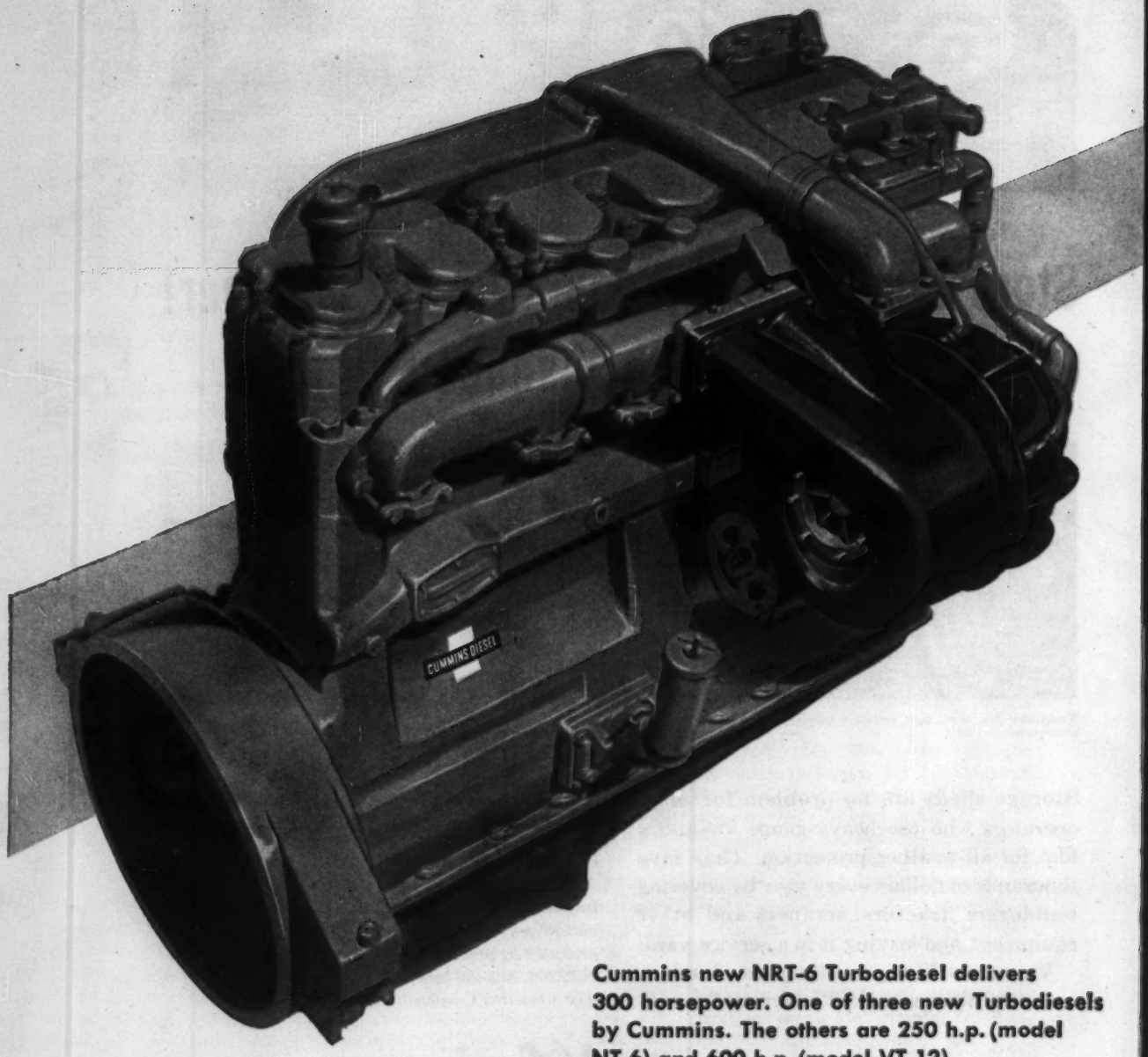
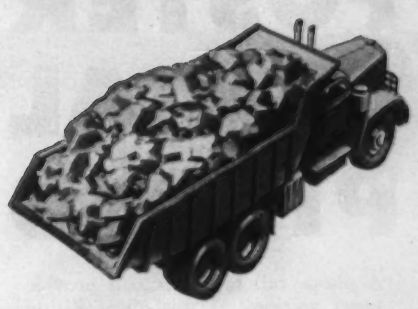
NEW TURBODIESEL



Cummins new NRT-6 Turbodiesel delivers 300 horsepower. One of three new Turbodiesels by Cummins. The others are 250 h.p. (model NT-6) and 600 h.p. (model VT-12).

BY CUMMINS



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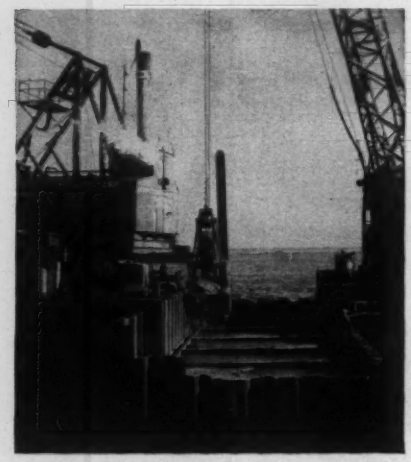

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Kentucky Orders Surveys For New River Span

Kentucky officials have recommended that immediate surveys be made for a new $10-million toll bridge across the Ohio River between Cincinnati and Covington.

Although the span's exact location has not been determined, it will be built to tie in with the proposed Florence-Covington Expressway and with Cincinnati's master traffic plan.

The bridge would be part of a $33-million program for the northern Kentucky-Cincinnati area. Also involved would be an $11-million highway in Kentucky and the $12-million Third St. distributor in Cincinnati, both of which would connect with the bridge.

Ohio and Cincinnati already have made surveys on placement of the bridge. But an additional study must be made by Kentucky in order to sell revenue bonds for the project.

The bridge would be the fifth in the area. According to traffic studies, the maximum capacity of the present toll bridge will be reached by 1966. Traffic congestion on the other three bridges has been getting progressively worse.

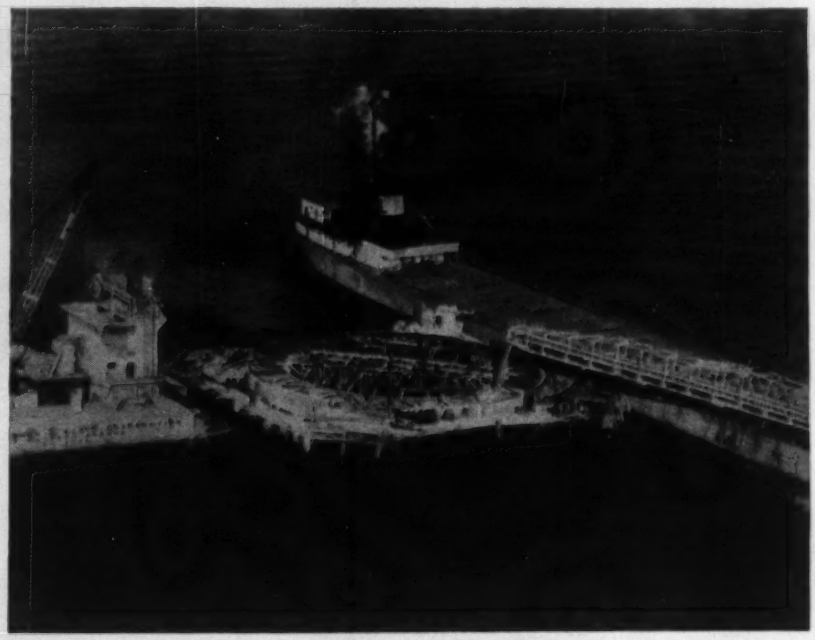
Government Aid Assured For Redevelopment Plan

San Francisco's $8-million Diamond Heights project, pilot unit for the city's entire redevelopment plan (ENR Dec. 16, 1954, p. 28) cleared a major hurdle last week when it was finally approved by the federal government.

After five years of paper work, actual construction may get under way soon, according to Engene J. Riordan, director of the San Francisco Redevelopment Agency. By Dec. 1, the agency can expect to start buying the 325 acres of sparsely settled land, largest remaining undeveloped area in the city, according to Riordan.

Then buildings will be razed, land cleared and plans drawn. After this

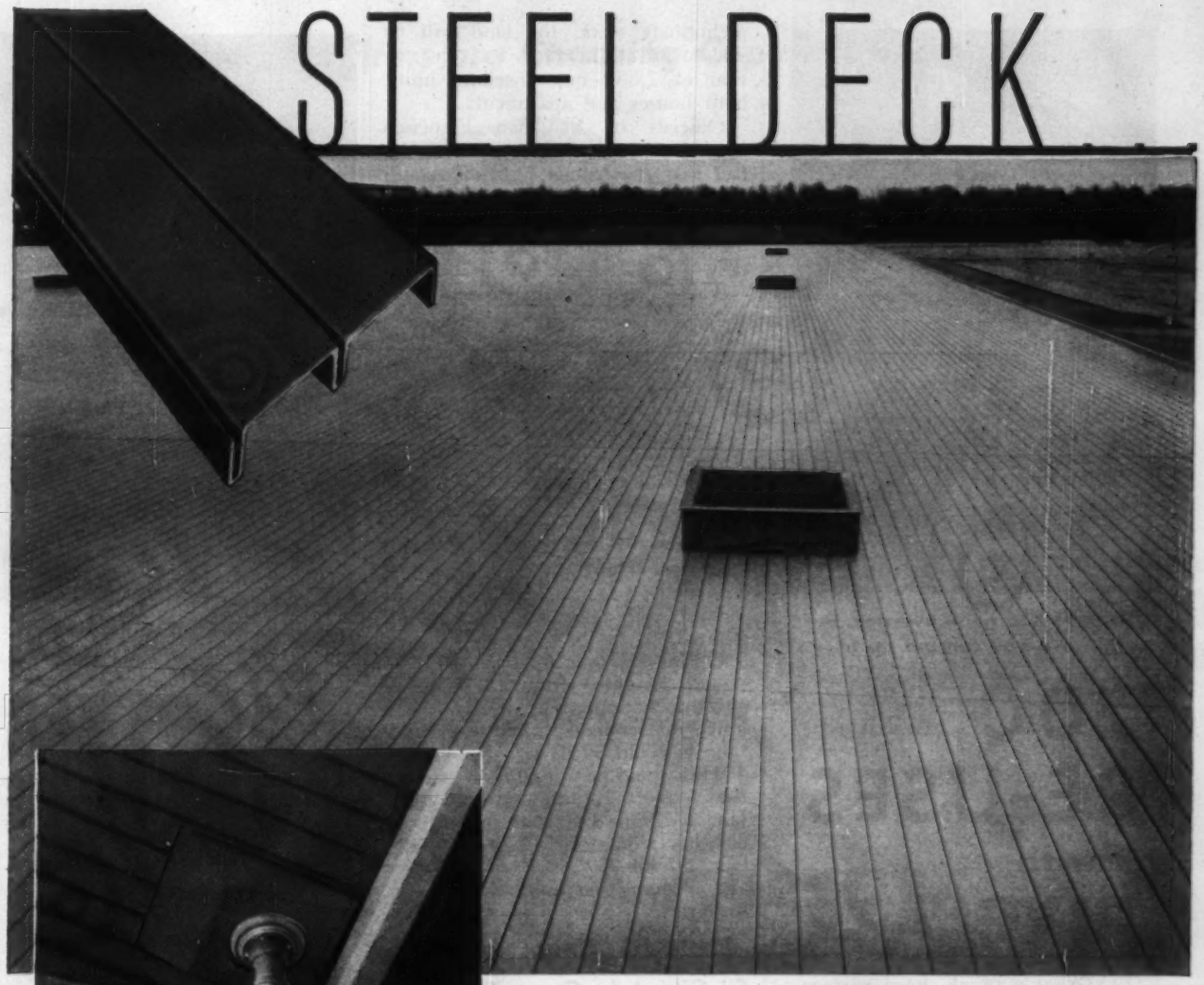
(*Continued on page 32*)



Faster and Faster on Mackinac Bridge

Underwater concreting of the foundations of the Mackinac Straits Bridge in Michigan is going ahead even faster than during last year's record-breaking construction season. Then, the best single day's production was in October when 5,040 cu yd were placed in 24 hr, while during the same month an average of 4,100 cu yd daily was placed in five consecutive days (ENR Jan. 27, p. 35). In May of this year these comparable figures were raised to 6,250 cu yd and 4,836 cu yd. The Prepakt Concrete Co., Cleveland, subcontractor on the work, whose special grout concrete is being used for 450,000 cu yd of concrete in 34 piers, claims that these figures represent all-time highs for underwater concrete placed from floating plants. In the method being used the aggregate is first deposited in the foundations by belt conveyor from self-unloading boats (right, in picture) and then injected with mortar made in the plant (left, in picture). The mortar contains cement, sand, fly ash and a patented additive. Contractor is Merritt-Chapman & Scott Corp., and the designing and consulting engineer is D. B. Steinman, both of New York.

STEEL DECK...



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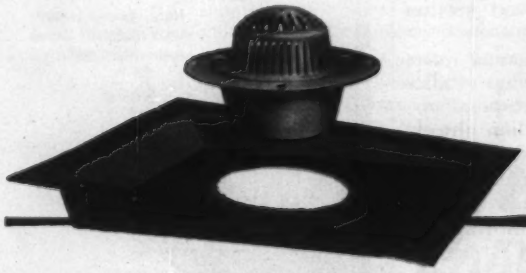

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Mahon Roof Sump Recesses for use with Mahon Steel Deck can be furnished to fit any roof pitch. Mahon Cast Iron Sumps can also be furnished for 4", 5", and 6" conductors.

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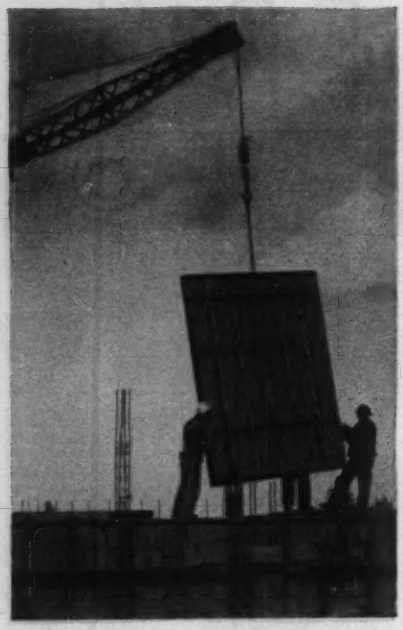

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preliminary work, the land will be sold to private investors for construction of 2,800 new dwelling units, both houses and apartments

Officials of the San Francisco agency were not concerned over the fact that the federal Urban Renewal Administration lopped off part of the money requested. The city asked for $8,062,314 in federal aid, but will get only $7,419,792.

The federal agency cut the request because it wants the project completed in five years instead of seven, thereby reducing administrative costs, Riordan explained.

The city agency requested a loan of $6,968,604, but will get $6,647,343. The city also will get an outright federal grant of $772,449 instead of the $1,093,710 it requested.

San Francisco's Board of Supervisors, which must approve the project, plans to call public hearings, so that another month may be required before all approvals have been granted.

Optimistic over approval of Diamond Heights, Riordan predicted government approval of the city's other major project, Western Addition, in about 30 days.

This would permit work to start on the Western Addition project about Jan. 1, 1956. For that project, the city has requested $17,299,216 as a lien, $7,366,979 as a capital grant and a completion time scheduled for five years.

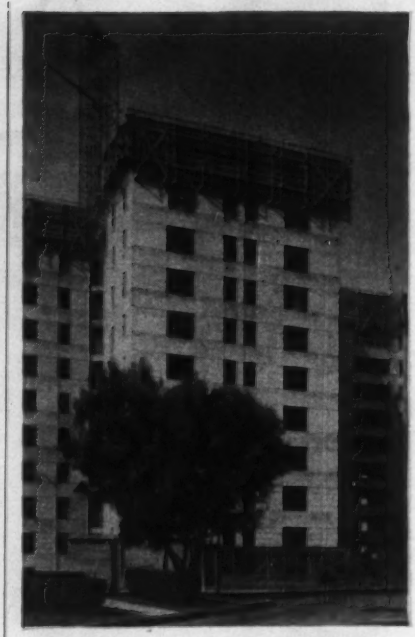
Citizens Urge Plant Move So City Asks Court Trial

Spokane, Wash., has asked for a superior court trial on a suit by citizens who oppose the proposed location of a $2-million sewage disposal plant.

Approximately 7,200 persons have signed petitions asking that the plant site be moved 9,000 ft downstream from its proposed location on the Spokane River. Petitioners contend that the plant will be an eyesore and a nuisance to a new residential area developing in the northwest section of the city.

The site was selected nine years ago when first engineering studies were made for a sewage disposal system. More than $2.6 million already has been spent on this system, which will serve the city when the plant begins operation.

Engineers report that moving the plant downstream might cost $1.8 million more than original estimates. And the City Council, which declined to submit the added cost to voters in the form of a bond issue proposal, said it would go ahead with the original plan.



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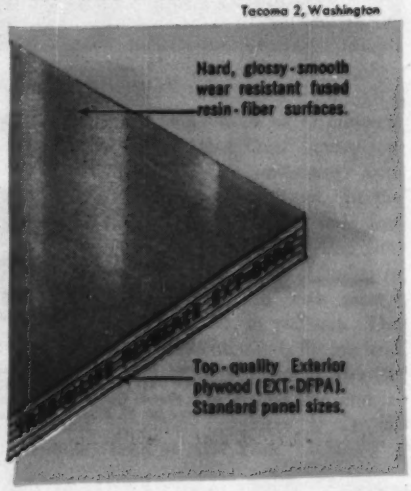
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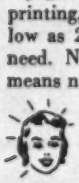

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African Airbases—A Job Well Done

V. B. Smith
Washington News Bureau
Engineering News-Record

[This is the second of two reports by Mr. Smith on his tour of the African airbases. The first report appeared in the April 7, 1955 issue.]

Overseas constructors in North Africa and Arabia have rolled up a record of solid accomplishment on U. S. airbases built under direction of the Army Engineers during the last four years. And they are adding to that record today as they complete earlier programs and tackle new projects with the sure skill of veterans.

Biggest part of their work has been the construction and enlargement of six Air Force bases, four in French Morocco and one each in Libya and Saudi Arabia. Pilots will tell you that the runways put down on those bases by the Corps of Engineers and its contractors are as good as you will find anywhere.

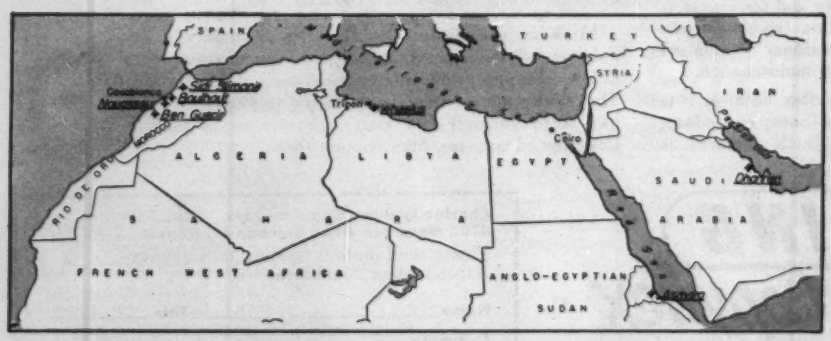
Construction men make the same comment about the supporting facilities in and around the six bases. Compared with equivalent works in this country or elsewhere, the quality of construction is better than merely satisfactory; it is good.

That kind of construction didn't some to pass without a lot of sweat, both physical and mental. The engineer-contractor teams in the three countries went through plenty of travail before they learned how to meet, circumvent or turn to advantage all the new and difficult problems that arose—and keep rising still—in varied forms. In the course of that rigorous education, the base builders soon became expert at fitting their operations to foreign conditions for the benefit of the job.

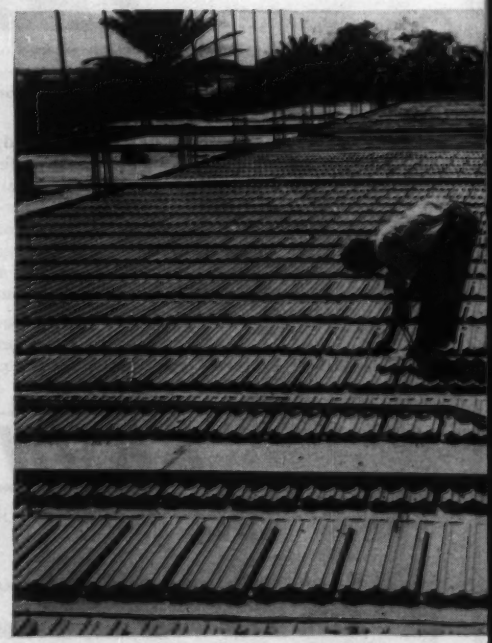
Now construction in the three countries has settled down to a well-organized, tightly-run business. The special, added know-how of the engineers and contractors pays dividends every day, not only when operating in familiar territory but also when moving into a new country.

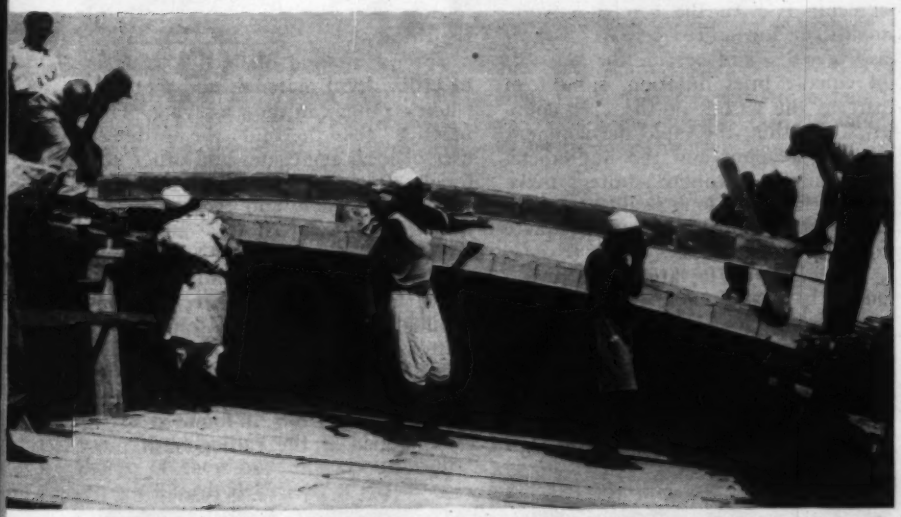
Value of the acquired skills was evident this year when the Corps of Engineers and Crow-Steers-Shepherd, the joint-venture contractor in Libya, started a new $8-million communications station for the Army Signal Corps at Asmara, in Eritrea, near Africa's Red Sea coast. Before the first boatload of supplies started off on its long trip via the Suez Canal, the construction planners had solved most of the problems that might plague this new project in a foreign land.

Similar ability to forestall difficulties and anticipate needs can be found throughout the base-building organization from Morocco to Arabia. It



ALONG 4,000 MILE DEFENSE SECTOR stretching from Atlantic Ocean to Persian Gulf, the Corps of Engineers is carrying on construction at six airbases and a communications station. Not shown are related projects at aircraft warning and control station.





PREFABRICATED TILE UNITS to make up arch roof rest at both ends on soffitt forms supported by falsework for longitudinal tie beams of warehouse roof system at Wheelus Field.

PURLINS ARE CONNECTED to arch ribs of steel-frame hangar after ribs were raised into place by truck cranes. →

← **TILE FLOOR SYSTEM** for concrete T-beam construction uses tile pans between pairs of prefabricated joists. Reinforcing is placed in channel between pairs preparatory to placement of concrete filler and topping over entire floor panel.

CONCRETE BLOCKS made on the job are laid up in barracks wall by trained Arab masons at Dhahran. Training of native workmen proved generally less productive at this Middle East base than in Libya and Morocco. Complex requirements of Arabian law made it advisable to employ all workers through labor contractors.

. . . African airbases—a job well done

shows up first of all in the office of the Corps of Engineers' Mediterranean Division, which holds top responsibility for the entire spread of work.

• **Command organization**—This office sits in the center of the biggest single program—at Nouasseur, the largest of the four bases in French Morocco. Since the first of the year, the division office has been handling design and construction of the Moroccan projects, taking over these functions from the Corps' discontinued East Atlantic District. Working together, the Engineers and Atlas Constructors, joint-venture contractor in Morocco, have completed more than 90% of a $375-million program that is now being expanded to larger size.

Projects from Libya east are under the direction of the division's Middle East District. At far-away Dhahran Field in Saudi Arabia, the area engineer and contractor have had a type of responsibility slightly different from the other bases. Dhahran work has been carried out under an architect-engineer - management - construction contract, with the Fluor Corp. of Los Angeles, that included design. The Dhahran construction team has pretty nearly completed its $45-million program and expects to finish the project this fall.

Designs for other projects of the Middle East District are produced in the district offices at Tripoli. Construction in Libya, by Crow-Steers-Shepherd, amounts to nearly $60-million completed at Wheelus Field and several small, remote stations, plus additional work to be allocated under the fiscal 1956 program.

• **Rush is over**—In a broad sense, the operations now under way on airbases in French Morocco, Libya and Saudi Arabia look much like the work you would see on continuing construction of military installations in the United States. There are striking differences, it is true, in the dress and speech of native workmen—and in some of the methods of construction. But the jobs as a whole have the orderly, efficient appearance that one finds on well-managed projects in this country.

Gone are the rush and emergency drive that marked the onset of the defense build-up in 1951, when the Korean conflict threatened global war and put a premium on speed. There still is plenty of push for fast construction, as attested by the finishing operations on the bomber bases in French Morocco (ENR Aug 27, 1953 p 30) and more recently by the rapid completion of the Boulhaut fighter base there (ENR, April 7, 1955 p 38). But the earlier urgency long ago settled down to a steadier pace that produces results on schedule without the overtime pressure that runs up costs.

In place of that pressure, the base builders during the last three years have stressed systematic cost-cutting methods of construction. This emphasis is evident on all six airbases.

• **Built to last**—Adequacy and economy are the top criteria for construction at every base. But it is not economy alone that limits design of all facilities to a ten-year life expectancy. There are more compelling reasons for austerity. Present U. S. base rights agreements with the foreign governments run for limited periods, as short as five years, and provide for renewals of equally brief duration, subject in part to the wishes of the host countries. Further, the rapid development of new weapons and the unpredictable changes in military strategy make it uncertain how long facilities as now built will remain useful and adequate for defense purposes.

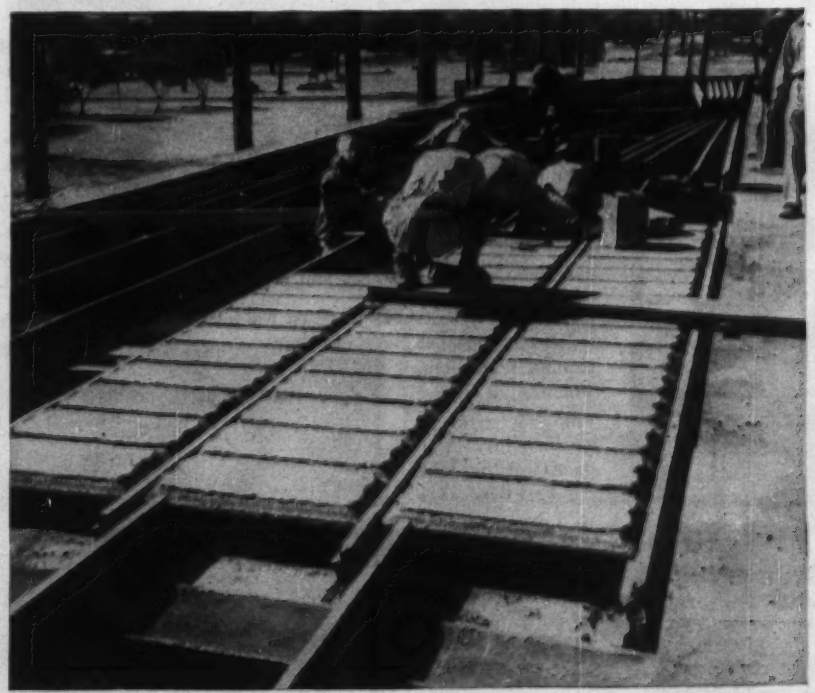
Actually, the facilities constructed on the bases are much better than ten-year life implies. With proper maintenance, practically all the construction will outlast the 50-year life assumed in design of permanent military works.

That is so in part because design for present loads and purposes demands quality construction—in runways, taxiways, aprons, hangars, water supply, sewerage and POL (petroleum-oil-lubricants) systems, as well as in many other facilities. Also, in the territory of the Mediterranean Division, durable masonry construction is cheaper than building temporary structures with imported wood.

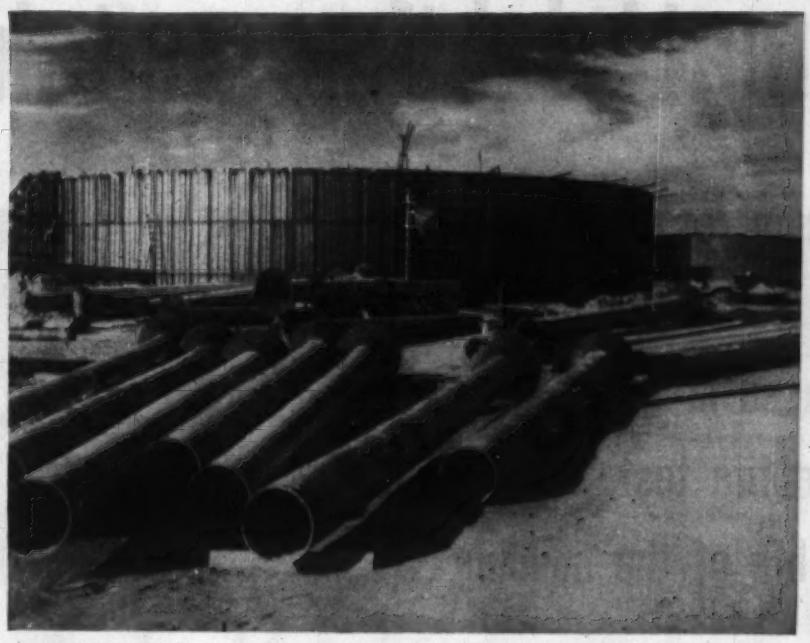
• **How to save**—Costs are cut by two main methods. The biggest saving is made by using native manpower to the greatest possible degree, thus reducing the need for higher-priced, imported personnel. As part of this effort, work is subcontracted to local firms wherever feasible. Either way, the policy pumps money into the local economy and buttresses cordial relations between the Americans and their hosts.

Second method of cutting costs is to utilize local materials and methods wherever they can show a saving. This practice goes beyond the ordinary uses of local aggregates and other materials. It embraces also the adoption of some products and techniques familiar to local builders but little known to Americans.

Both fixed-fee and lump-sum contracts have proved effective in controlling costs. Moroccan operations shifted from a fixed-fee to a bid-price arrangement in August, 1953. The changeover was a further refutation of the caustic but ill-founded criticisms aimed at the earlier crash pro-



PRECAST CONCRETE JOISTS are used in this floor and roof system, with concrete pans—top and bottom—separating the joists.



NEW TYPE STEEL "INCLAVE" LINER forms inner surface of prestressed concrete storage tank at Wheelus Field. It is sheet steel with Z-shaped bends that key into concrete. Foreground are corrugated steel shells for reinforced concrete roof columns.

gram in that country. For good reasons, the work in Libya and in Saudi Arabia remained on a fixed-fee basis, and the Eritrea project is being built under the same arrangement.

Unit-price, or lump-sum, bidding in Morocco has the full endorsement of everybody involved. Atlas Constructors, prime contractors for the Moroccan program, like the lump-sum arrangement because it puts them in charge of their own operations, fully responsible for delivering a job in accordance with specifications and for making a profit or absorbing a loss on the basis of bid prices. The Army Engineers and the Air Force favor bid pricing because it helps fix costs in advance of construction and provides an added brake on change orders and extras.

No similar shift of contracting procedure was recommended for Libya or Saudi Arabia. By the middle of 1953, construction in those countries was over the hump, and a change from fixed-fee to lump-sum was not worth the administrative effort it would cost. Under both contracts, the fixed dollar fees were low, amounting to less than 2½% of the construction cost. (For the original, much bigger Moroccan contract, the sum fixed as the fee figured out to be an even smaller portion of the estimated cost —only 1.78% of $300 million.)

Other factors favored retention of the fixed-fee contracts in Libya and Saudi Arabia. The Libyan contract, for example, provided favorable rental rates for a large amount of construction equipment supplied by the contractor. Taken together, the arguments for retaining the existing contracts outweighed any possible advantages to be gained by a switch to lump-sum.

• **Lawmakers make delay**—Much more critical to these overseas projects than the form of contract is the unavoidable delay that sometimes holds up the planning of future work. The Air Force knows what additional construction is needed, and the Corps of Engineers can do some sketchy preliminary planning. But final plans and actual construction have to wait for Congressional action and definite directives from Washington.

A situation of that kind tied up forward planning in Morocco early this year. The $375-million funded program for that country was drawing to a close, and a big supplemental program was in prospect that might run to $60 million or more. Field decisions hung fire until definite information came on the new program.

Up to that point, Atlas Constructors had faced the tough alternatives of sending its American employees home or of holding them in Morocco at considerable expense for potential work that might not materialize. With construction activity declining to $2-million a month or less, the contractor could not long afford to carry an organization big enough to handle a heavy pending program that might be indefinitely delayed.

At the same time, while waiting for instructions from Washington, the Mediterranean Division had to sit tight on preliminary plans and hold off decisions on retaining construction equipment for the new work. Only after definite word was received could the Army Engineers start their construction plans and order the rebuilding of some 400 pieces of government-owned heavy construction

(*Continued on page 40*)

ARCH ROOF AND FLAT ROOF warehouses at Wheelus utilize the tile beam units—prefabricated on ground—for roof and mezzanine floor systems.

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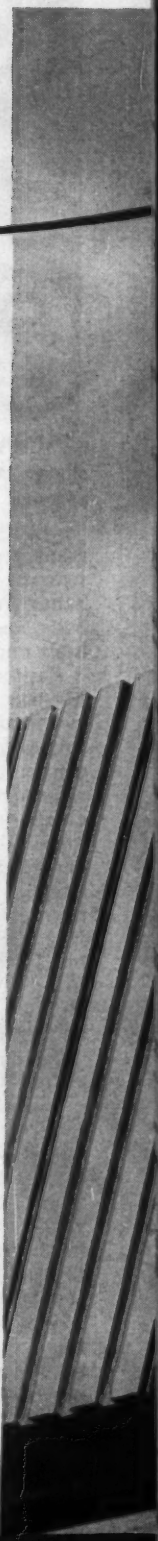

IF FIRST COST were the only consideration in planning a modern building, many of today's construction practices would be out the window. But first cost is only part of the picture; it's only one of the factors that determine overall cost for the life of the building.

That's particularly true of materials used for curtain-wall construction. There are materials with a lower original cost than Stainless Steel. But in the long run, the advantages of Stainless more than offset any difference. Here's why:

Stainless Steel has proved its ability to stand up in the face of atmospheric corrosion. The Empire State Building's Stainless trim has been in service a quarter of a century; there's no evidence of corrosion. Industrial buildings have given satisfactory service even longer. Besides, Stainless is the material to which the process industries turn when they have a severe corrosion problem.

Stainless Steel is attractive and decorative and it will remain that way through the life of the building. Cleaning—simply for the sake of appearance—is infrequent and easy.

Because of Stainless Steel's inherent strength and because no allowance need be made for the effect of corrosion, thin sections can be used. This lighter weight translates itself into important savings in building construction.

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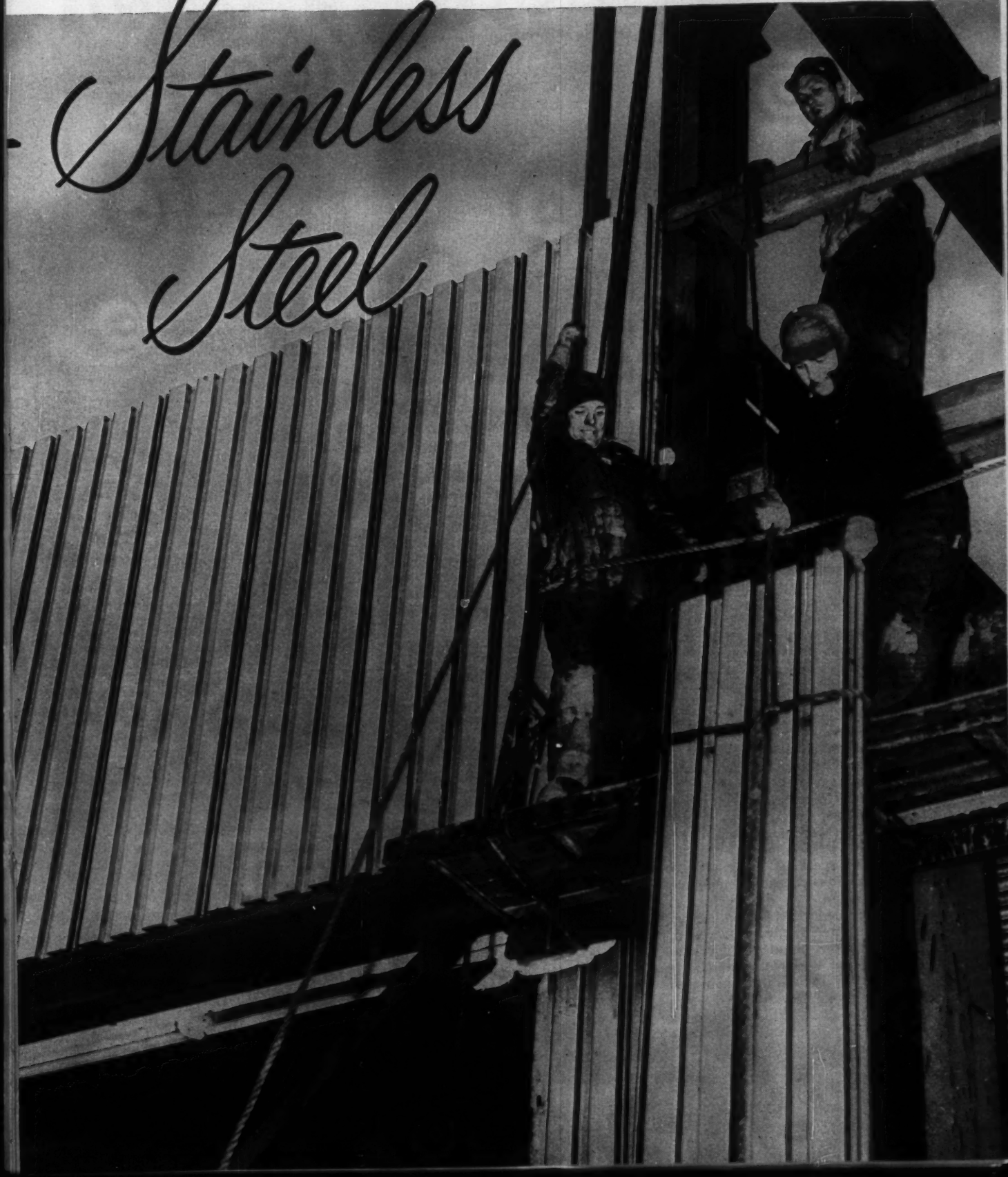
wall construction

Stainless Steel



equipment. If the program had not gone through, these machines would have been offered for sale as surplus, along with the rest of the Moroccan equipment now dispersed to Spain and other countries in Europe, Africa and elsewhere.

Preparations for the 1956 North African program in Morocco and Libya are based on the contingency of an anticipated allocation in excess of $70 million, subject to Congressional action on appropriations.

• **Using local labor**—Contractors at all the bases employ local labor to the greatest possible extent. In Morocco and Libya, the contractors are able to draw on large numbers of local Europeans, both by employing them directly and by letting subcontracts to local builders.

In those countries, too, the contractors have had the greatest success in training native Arabic-speaking workmen. Similar efforts have proved less productive at Dhahran, where the working force—supplied by labor contractors—has consisted almostly entirely of untutored Arabs with little aptitude or inclination for learning skills. Arabian masons, however, did learn to do concrete block work, and other natives became good welders and electric linemen.

Libyan natives on the other hand, took to new skills like ducks to water under the effective training programs set up by Crow-Steers-Shepherd. The contractor built up the proportion of the native Libyans on the payroll to 85% at the manpower peak of nearly 3,000 employees and increased it to 92% as total employment declined to 1,250 early this year. At that time, Americans and local Europeans accounted for about 4% each.

Especially impressive was the contractor's success in training native workers at skilled crafts. Libyan natives have filled supervisory and skilled jobs in numbers such as these: 28 supervisors, 74 foremen, 145 plumbers, 135 carpenters, 116 masons, 98 electricians, 28 sheet metal workers, 25 riggers, 20 welders and 40 clerks. The Arabic-speaking Libyans also serve as skillful operators of construction equipment.

On Moroccan work, Atlas Constructors has similarly trained native workers and retained them in larger proportion as the workload declined. In August, 1953, when the change to lump-sum took place, the Atlas payroll included 60% native Moroccans, among 7,400 employees. By this year, the ratio had increased to nearly 67%, of 4,150 then on the list. In the same period, the proportion of local Europeans on the contractor's payroll decreased slightly from 16 to 14%. Americans accounted for less than 20%.

At Dhahran, the ratio of imported workers is necessarily higher. It has ranged generally around 25% of the total working force but, by the beginning of the year, had been reduced to about 22%, with employment at that time down to 1,400 from a peak of 2,000.

• **Design standards**—Design of the bases generally follow standard American practice. But variations are made to utilize economical foreign techniques. In Morocco, for example, a French design employing prestressed concrete framing for arch-roof shops and warehouses has been used extensively, as described in the earlier article on the bases (ENR Aug. 27, 1953 p. 30).

In Lybya, roof and floor systems ot Italian origin have been applied successfully to warehouses, hangars, dormitories and many other buildings, including a 150-bed hospital now under construction that will cost nearly $4 million.

Seven such systems have been employed in various buildings on a cost basis, often a result of competitive bidding by local contractors. All seven have proved practical and economical in this area of plentiful low-cost labor.

Five of the systems utilize hollow clay tile units from Italy. The two others use contractor-made concrete units.

All these systems permit on-the-ground prefabrication of floor and roof beams (or, more precisely, joists) prior to placement in the building. These prefabricated beams are carried and set by hand in lengths up to 20 ft or more. Also, the fabricated units—with one exception—bridge the full distance between framing members of the structure and support working loads with little or no intermediate shoring.

Clay tile units are manufactured in a range of sizes, to fit varied spans and loads. Also, units of the same cross section are available in several different lengths—not only to accommodate various spans but also to facilitate staggering of joints in adjacent joists.

• **Prefabricated units**—Prefabricated beams are made up, with a slight camber, by mortar-jointing the assembled units and placing longitudinal reinforcing rods which are mortared into outside grooves in the tile. When the prefabricated beams are put in place in the building, hooked ends of the reinforcing rods protrude into the forms for the structural members. The entire floor or roof panel is tied together by integral concrete topping —plus filling between the joists—placed monolithically with the concrete in the framing members.

The SAP tile system, most commonly used on the Libyan projects both for flat panels and for arch roofs, places the prefabricated beams side by side with bottom flanges touching. For long spans and heavy loads, the contractors have employed a variation known as SAPAL, which adds T-beam strength to the floor panel. Prefabricated beams are placed in pairs, with adjacent pairs spaced by tile pans, top and bottom. Channels between paired beams are reinforced with rods and stirrups for T-beam action with the top slab.

T-beam principles are applied also with prefabricated beams of hollow concrete blocks in the Rosacometta system. The prefabricated joists of this system, however, must be supported during construction. Another system, the Varese, employs precast concrete joists supporting precast pans, top and bottom, with integral concrete topping over the entire assembly.

• **Terrain is a factor**—Climate and terrain vary widely in the three countries. French Morocco is something like Texas. Three of the Moroccan airbases—Nouasseur, Sidi Slimane and Boulhaut—lie in an area of flat or rolling land that is fairly well watered by winter rains. Farther south, Ben Guerir is located on an arid plateau within sight of the Atlas Mountains, which are snow-covered in winter.

Wheelus Field, outside Tripoli, lies next to the Mediterranean in the relatively small part of Libya that receives enough moisture to make farming possible. Farther east, the desert comes down to the shore.

Dhahran Field in Saudi Arabia, however, is really the desert outpost among the airbases—the end of the line for the Military Air Transport Service in this part of the world. The sense of isolation at the barren base is only slightly relieved by the fact that a few miles away lies the green and inviting little town of Dhahran, built by Aramco, the Arabian-American Oil Co.

Aramco cooperation in furnishing supplies, materials, spare parts and other needs has been a big help to the airfield builders all through the job. But the oil company town can serve only as a place to visit. All airfield personnel have to live on the base, with nothing in view beyond it but dry sand—and nothing to drink, under

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strict Arabian law, but milk and water. Family quarters are almost non-existent. Under those conditions, manning the project with competent people has been a persistent problem.

Air conditioning is the distinctive and essential feature of all buildings for human occupancy at Dhahran. Atmospheric temperatures go up to 120 deg F and higher, while ambient temperatures of 150 deg or even more are registered over paved areas.

Three central plans plus an independent unit for a 50-bed hospital, now being completed, supply chilled water at about 40 deg to Dhahran buildings for air conditioning. The chilled water and return lines consist of wrapped steel pipe incased in lightweight vermiculite insulating concrete. Domestic hot water and return lines, incidentally, are laid in the same conduit encasement. An automatically controlled air-conditioning system in each building can lower inside temperature 30 deg below atmospheric.

• **Water supplies**—Water treatment is another essential at Dhahran. An apparently adequate underground supply has been tapped by wells, but this water has to be softened for general use and distilled for drinking.

An automatic softening plant with a capacity of 850,000 gal in 16 hours supplies sufficient water except at summer peaks, when special efforts are necessary to curb the native Arab tendency to let fixtures run. Ion-exchange softeners reduce the hardness from 900 ppm to 15 ppm.

Softened water has to be distilled for drinking and cooking purposes, to remove remaining salts. A distillation plant is equipped with four vapor-compression-type units, each capable of producing 50,000 gal of distilled water per day. Only three of the units operate at one time.

Adequate supplies of potable water have been developed from wells at all other bases except Nouasseur, where water has to be furnished from the municipal water system of the city of Casablanca.

As for construction of aircraft utilization areas—runways, taxiways and aprons—nothing more need be said that these areas at all the bases meet the highest standards of U. S. practice. Asphaltic concrete is used almost exclusively for the pavement, except for the runway ends and apron at Boulhaut. Designs generally are based on 100,000-lb wheel loads, with a reduction to 90,000 lb at Dhahran and to 25,000 lb for fighter planes at Boulhaut.

Overall costs of airfield construction have been moderate. The total cost of paved aircraft utilization areas has averaged about $7 per sq yd at Dhahran and about $9 at Wheelus. These costs are on a par with those previously cited for Boulhaut in ENR, April 7.

• **Fuel lines**—Fast fueling of planes is a standard feature of all the bases. Hydrants built into the hardstands permit pilots to fuel or refuel their planes by pushbutton control at hundreds of gallons per minute. Adjacent to each set of hydrants is a fuel-pumping station, with an ample supply in "immediate storage" tanks. These tanks are tied into the bulk storage on the base.

Completion of some major off-base POL lines has been delayed for various reasons. But 250 miles of pipe lines connecting the various bases in French Morocco are complete, and the contractors at Wheelus Field are now installing submarine lines at a selected location that will permit the unloading of much larger tankers than has so far been possible at Tripoli.

Large tanks for bulk fuel storage at the bases in general are steel. Wheelus, however, has recently completed construction of several prestressed concrete tanks incorporating a new type of steel "inclave" liner, a sheet steel keyed into the concrete by Z-shaped bends.

Of the top men responsible for work in the Mediterranean Division, Brig. Gen. Walter K. Wilson is division engineer, (succeeded this month, July, by Brig. Gen. Benjamin B. Talley), and Col. A. D. Chaffin, Jr., is district engineer, Middle East District. Area engineers for this district at present are Col. H. S. Gould at Dhahran, Maj. H. E. Hallowell at Wheelus, and Maj. C. C. Cole at Asmara. In Morocco, area engineers reporting directly to the division are Lt. Col. W. P. Regar at Nouasseur, Lt. Col. W. E. Shepherd at Ben Guerir, and Maj. H. B. Crouch at Sidi Slimane. Lt. Col. J. O. Craig is installations representative for all Air Force work in the Mediterranean Division.

For Atlas Constructors in Morocco, N. D. Teters is general manager, with G. G. Werner as assistant. Paul W. Downey heads Crow-Steers-Shepherd operations in Libya and Eritrea as general manager. At Dhahran, N. H. Cawthon is project manager for the Fluor Corp.

Atlas Constructors are made up of five firms: Morrison-Knudsen Co., Inc.; Bates & Rogers Construction Corp.; Ralph E. Mills Co., Inc.; Blythe Bros Co., and Nello L. Teer Co. The Crow-Steers-Shepherd combination consists of William L. Crow Construction Co., J. Rich Steers and Shepherd Construction Co.

Cleveland "80" uses long reach, accurate pipe handling, teams up with trencher on tough 10-mile water line job

KIEFFER BROTHERS, contractors of Mount Carmel, Ill., matched their Cleveland Model 140 trencher and Model 80 side crane against 10 miles of really rough work on a 10-inch cast iron water main job in Loogootee, Ind., this winter. They report their decision paid off well in both time and money saved.

Cutting the 10-mile line through hilly terrain alongside a curving road, Kieffers' trencher maintained a fast, dependable pace overcoming frost and plenty of Indiana sandstone. Despite the tough digging in close quarters, the "140" left a clean trench ready for pipelaying.

Kieffers' "80" kept the pipelaying operation up close, usually only a couple of joints behind the trencher. The one-man-operated "80" picked up the pipe strung along the opposite side of the road, turned on its maneuverable full crawlers and accurately positioned the pipe for fast, easy installation. The Model 80's large, easy-acting hydraulic clutches and smooth handling brakes and boom hoist which placed and held pipe exactly to required positions also are responsible for its outstanding speed and accuracy when employed as a backfiller.

Cleveland's perfect operator visibility and well placed foot and hand controls, clearly shown in these photos, keep operators at top efficiency for top production all day long.

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Subway Line Goes To Sea

Before another year is over, one of New York City's farthest-flung outposts—known to generations of city-bred vacationers as "The Rockaways"—will again have direct access by rail to the parent city.

Access will be via an overwater route of the city's subway system—making it possible to travel for 15 cents from "The Rockaways" through downtown Brooklyn and Manhattan and on to the almost equally far-flung corners of the Upper Bronx more than 30 rail miles away.

Construction of the $25-million, double-track connecting link that will make this travel possible—a six and one-half mile combination of precast concrete trestle, steel girders and two swing bridges—has occasioned more than two years of difficult construction operations, much of it conducted from water-borne equipment. It has involved such operations as both burying and removing portions of an old railroad trestle, dredging, steelwork, concrete precasting and placing of precast members, removal and replacement of utilities and provisions for carrying on water, land and air traffic during construction operations.

• **Geography**—The Rockaways (there are three of them—Rockaway, Rockaway Park and Far Rockaway) are a series of communities covering a narrow sandspit that forms part of the southern shore of Long Island, and encloses within it the marshy area of Jamaica Bay. Entirely within New York City limits, Jamaica bay is spotted with islands and sandbars—many of which disappear twice daily under the 6 to 8 ft tides—that made it originally a haven for game birds and fishermen. Years of industrialization along the shores of the bay plus years of dumping of sewage and refuse have polluted the waters badly. (The city is at present completing works to clean up these waters with the hope of converting the whole area into a wildlife preserve and recreation area.)

Nevertheless, the area has long attracted vacationers; many of the "islands" are dotted with fishing shacks, and the Rockaways themselves—with frontage on both the Atlantic Ocean and the bay—have become substantial summer resort and year round communities.

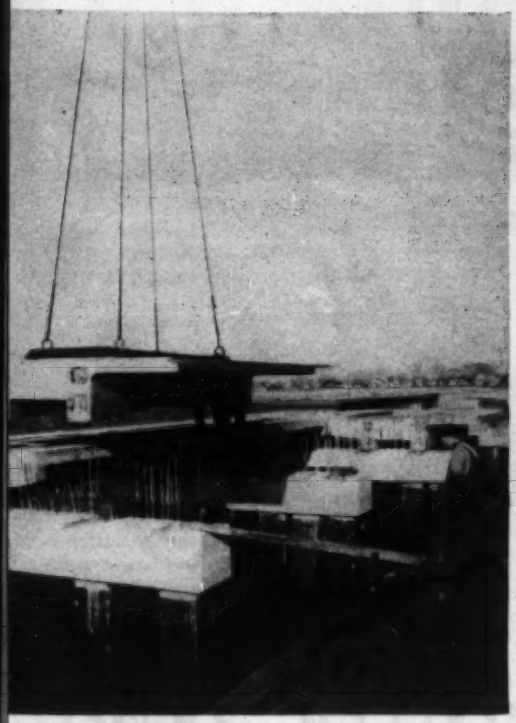
The area was served for many years by the Long Island Rail Road, over a long timber trestle running nearly straight south from the heart of the Borough of Brooklyn to Rockaway Park.

Becoming increasingly weakened by tides, marine borers, shifting sands and age, this trestle was also subject to almost constant fires. Three years ago, a major fire permanently put the trackage out of service. Rail service to Rockaway is now possible only by a roundabout connection.

With the Long Island then enmeshed in bankruptcy courts and no prospect of restoration of direct train service, the then newly constituted New York City Transit Authority stepped into the picture, purchasing the right-of-way (for about $8 million) and making plans to connect new construction with existing lines of its Eighth Avenue (Independent) subway system.

• **Plans**—Transit Authority engineers determined that the solution to the long overwater crossing would have to start with a pile-supported trestle at the north shore of the bay, leading out to a movable bridge over a channel known as North Channel; then a long stretch of track on a built-up sand island; then a low trestle leading to a second movable bridge over Beach Channel, to join existing rail facilities in the Rockaways, where the railroad line had been carried as an elevated section over local streets.

The condition of the old trestle was so bad that no attempt was made to salvage or use any portion of it. In addition to the years of damage, railroad maintenance had consisted largely of simply driving new piles next to old ones, holding the structure to them with makeshift splices and other connections. Result was a



SLABS WILL SUPPORT new double-track subway line extension. Looped bars at end tie to next set of slabs with dowels and grout to form continuous structure.

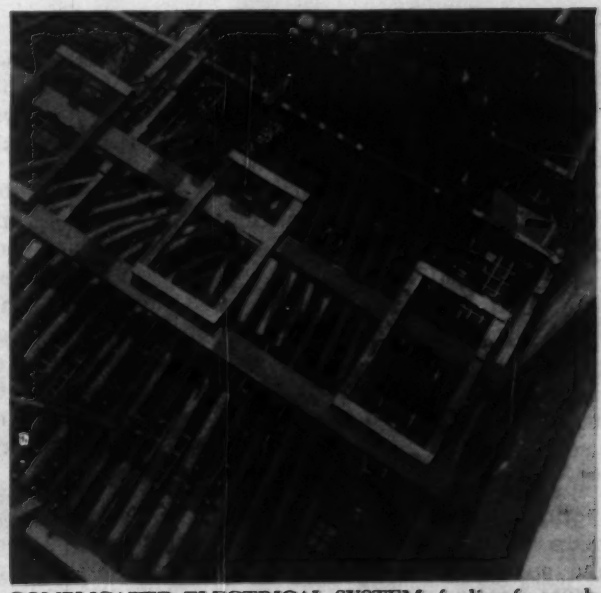
forest of badly rotted piling, much of it not even worth removing.

But the very thickness of the pile "bents" that resulted from this sort of maintenance made it possible for the Transit Authority to utilize many of them as an anchor for a built up sand island. Dredges of the Atlantic, Gulf and Pacific Co., of New York, piled up sand, obtained from dredging a new channel, around nearly half

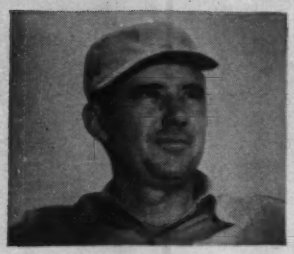
SHELLFISH, splices, bolts—and luck—held up old trestle that carried railroad trains to Rockaway Park for many years.

CONCRETE PILES to replace old trestle are stacked in casting yard, as contractor sets reinforcing for precast slabs that will form deck of new structure.

PLUGS CAST INTO PILE CAP CUTOUTS (circled) enable placing of slabs at exact heights for later grouting, without use of jacks for positioning.



COMPLICATED ELECTRICAL SYSTEM, feeding from submarine cable, is brought up through pivot pier in 48 cast-iron conduits that must be insulated from surrounding steel.

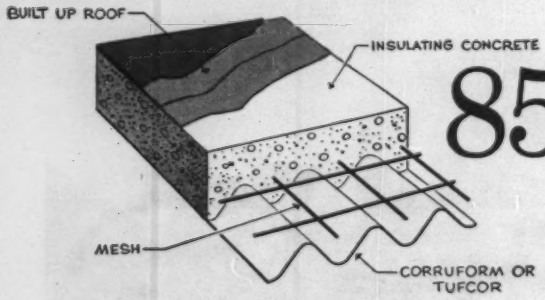


Job Superintendent

W. C. BOWEN says, "Roofing time was really important and Tufcor kept work moving ahead smoothly. Pre-sizing made it easy for two-man crews to place 7 to 8,000 sq. ft. a day, and pouring was fast, too—28,000 sq. ft. in one day. Tufcor gave us a strong roof and a safe working platform."

Contractor's Representative

WARREN O. LAMB says, "Speed and economy are two big advantages of Tufcor. Roofing proceeded on schedule and we saved the cost of shoring, too. That meant savings in time and labor costs."



85,000 sq. ft. fire-blankets

Nashville architects and builders provide fire protection for owners and tenants, thousands of dollars in insurance savings.

An 85,000 sq. ft. roof of Granco Tufcor and Corruform with lightweight insulating concrete greatly increases the fire safety of the new Green Hills Village Center, a two-story multi-shop facility which will serve over 5,000 Tennessee families in the suburban area about 6 miles southwest of Nashville, Tenn.

Because of its fire-resistant qualities, the Tufcor-based roof serves as a positive check against the spread of fire via the roof should it break out in any one of the center's several stores.

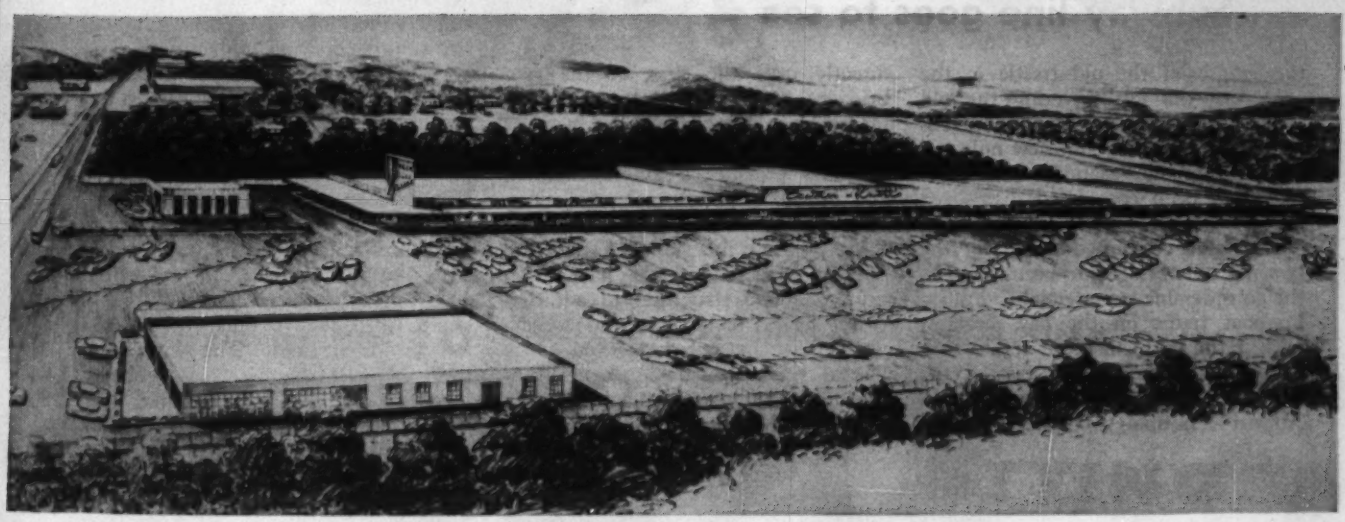
The speedily constructed Tufcor roof follows closely the design of Granco's Tufcor roof which performed so sensationally well in an ASTM E119-50 fire test in 1954. In that 45 minute test, at temperatures up to 1720° (F.), the Tufcor roof didn't burn, didn't feed the flames, and didn't fall. After the test, the roof was still able to carry the full design live load.

Warren O. Lamb, Vice President of W. C. Holt and Sons, general contractors on the Green Hills job, says, "Tufcor is a great time and money saving way to build a fire-safe roof. All you do is open a bundle of Tufcor sheets, place and secure them to the steel framework, and immediately trades have a rigid working platform!"

Tough-temper, corrugated steel Tufcor makes fire-safe roof construction simple, fast and economical. For information, estimates or costs on your building plan, contact home or district office, attention Dept. E-4.

Handles Easily, Places Fast. Tufcor arrives pre-cut to building size. Measuring and cutting is eliminated. Two or three men can place up to 10,000 sq. ft. a day.

Permanent, Fire-Resistant Roof Deck is formed by cast-in-place slab. A strong bond forms between galvanized steel sheet and lightweight concrete fill giving high-strength rigidity to finished deck.



Green Hills Village Center, *Nashville, Tennessee* • Owners: *William C. Weaver, Jr., & W. H. Criswell*
Architects and Engineers: *Hart, Freeland & Roberts, Nashville, Tennessee* • General Contractor: *W. F. Holt & Sons, Nashville, Tennessee*

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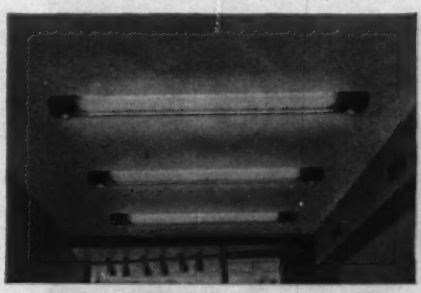
Insulating Concrete Placed on Tufcor is fast operation. On an average roof construction, this material weighs less than 6 pounds per square foot.

Perfect Base for Built-Up Roof. Deck offers two excellent advantages—a good firm base on which to apply the roof and an inorganic, permanent base for long life of the built-up roof.



Neat Plaster Ceiling over Fire-Safe Tufcor. Any normal ceiling treatment is easily applied to Tufcor. Its attractive galvanized surface is sometimes left unfinished when light reflection is wanted.

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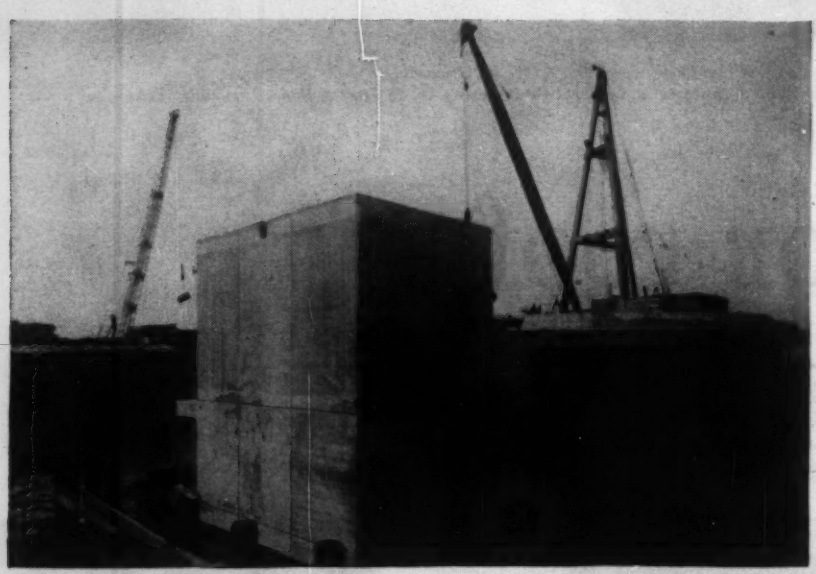
. . . Subway line goes to sea

the length of the old trestle in the center of the job, covering the old structure completely. Remaining rails have been removed, and new rails will be laid atop the "island" when settlement has been completed.

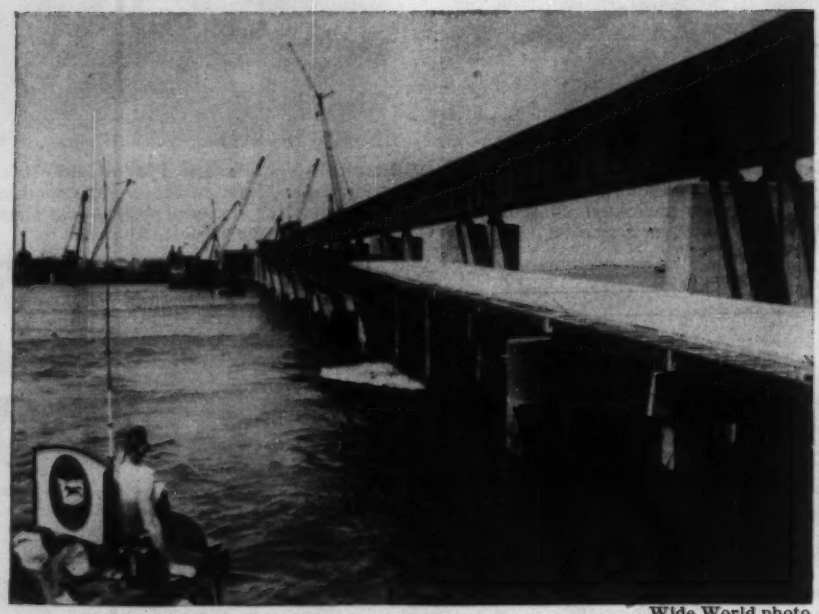
• **Air traffic concerned**—Need for the two movable bridges, to accommodate the considerable commercial and pleasure-boat traffic on the bay, brought with it the problem of air traffic.

Approach patterns for two of the runways of the city's huge Idlewild Airport—less than two miles away—lie directly over the sites of the two bridges. Airmen were concerned lest obstructions be put in the way of low-flying planes. The fact that Beach Channel provides a 200-ft channel, and North Channel a channel clearance of 150 ft ruled out bascule type bridges, since for railroad purposes only a single-leaf could have been used. Such a structure, in addition to the height of the leaf when raised, would have presented an even worse hazard, since it would be an intermittent obstruction.

As a remedy, the authority's consulting engineers for the bridges—Hardesty and Hanover of New York—designed two simplified swing bridges with very low contours: the top of the top chord being just 65 ft above mean high water. To further cut down on height, motors for these spans are placed in the supporting pier of the structure, rather than on top, and separate motors are used to drive end wedges fitting into the rest piers. Even the control houses for the swing spans are suspended from the top chord so as not to offer further obstruction to air traffic. The swing span over North Channel has a total length of 305 ft., over Beach Channel, 325 ft.



PIVOT PIERS for swing spans contain driving mechanisms in circular center section, "rooms" for electrical equipment in box-like arrangements at either side.



Wide World photo

RAMP APPROACH to swing span, looking north from Rockaway Park, is combination of slab deck and steel girders. Tracks form "Y" at this point for switching.

• **Construction starts**—First step for Merrit-Chapman & Scott Corp., of New York, under its $5.3 million substructure contract, was to move in a fleet of floating equipment that included at peak 14 derrick boats, a floating concrete batching plant, 20 scows, three tugs, seven personnel and workboats, and set up a casting and supply yard on the Rockaway shore of the bay. A railroad type, self propelled steam gantry crane, with a reach of up to 200 ft and a lifting capacity of 50 tons services this yard.

Next move was to employ the derrick boats to remove in the neighborhood of 15,000 old wood piles still remaining in the path of the new construction; and begin casting the hundreds of 2 ft square reinforced concrete piles that support the trestles. Made in lengths of from 50 to 75 ft, these piles presented no particular driving problems—their weight carrying them through the overlying layers of silt on the bay bottom to good sand almost without aid of the pile drivers.

• **Supports**—Almost simultaneously, crews began erecting cofferdams for the two rest piers and the pivot piers that support each swing span, and for the total of 30 smaller piers that make up the remainder of the two bridges.

All of the piers are founded on wood piles. The smaller piers vary in the height from 19 to 29 ft above mhw, but have uniform dimensions otherwise above the distribution blocks, being of elliprical shape, 4'6" ft wide and 26 ft long. After the supporting piles and sheet pile cofferdams had been driven and unwatered, a ½ in. wrought iron protective plate, of sufficient height to carry it about 2 ft above high water, was placed to serve as a form for the next section of the pier. With reinforcing cages placed, concrete was brought to the top of the plates. At this point, wooden forms were placed to bring the pier up to required height.

The rest piers are uniform for both

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bridges, as are the pivot piers. Rest piers stand on two legs with a span of 63 ft out to out, and incorporate within them hollow chambers to house electrical and cable equipment. Their tops are 23 ft above mhw.

Pivot piers include a 44 ft dia circular center section, and two rectangular wings, one 14 ft x 13 ft, the other 12 ft by 17 ft, to house electrical equipment.

All piers and pile bents, in addition to the wrought iron protective plates, are covered by mats of pressure treated timber to act as ice guards.

The 159 pile bents that form the rest of the structure consist basically of four of the precast concrete piles, each bent spaced 22 ft on center, and providing an average clearance of 4 ft 6 in. above mean high water. Alternate bents include one lateral batter pile (either to north or south) and every fifth bent contains one pile on longitudinal batter. Pile caps were formed and cast after the bents were driven. Concrete is extremely dense, an eight-bag mix achieving 7,000 lb. psf at 28 days.

• **Slabs—and ingenuity**—To bridge the spaces between the pile bents, designers called for precast concrete slabs 22 ft long by 15 ft wide, 8 in. thick, carrying on their undersides integrally cast concrete girders that project 2 ft 4 in (with a slight inward curvature) below the floor of the slab itself.

Casting these slabs (331 for the whole job) and placing them turned out to be a simple, money-saving trick for R. L. Hand, MC&S job superintendent, and his crew. They did it with practically no formwork, and without using jacks in final placement.

Here's how it worked:

Hand decided to cast the slabs upside down—with the girders projecting upward. First, he cast a very smooth concrete slab in the materials yard, within easy reach of the gantry. Then the reinforcing cage for both the slab and the girders was placed. And with wood forms in place just eight inches deep to form a boundary around the slab, concrete was cast for the slab. As soon as this initial cast had achieved some stability (a matter of a couple of hours) the crane lifted a pair of steel forms for the girders over the slab, and concrete for the girders was added. No further formwork was necessary.

To handle the slabs, once the concrete had set, anchor bolts were cast into one end. A half-round steel-reinforced rocker was placed over the other end. The crane then hooked on to the bolts, rocked the slabs upright and then over onto their bottoms. Conventional slings then sufficed to transfer the slab to barges and again to their final resting place atop the pile caps.

• **Setting slabs**—The slabs are set with their long sides spanning between the pile bents, two slabs forming a complete span 22 ft long x 15 ft 8 in. wide. The two slabs are tied together on the long side by steel dowels driven through looped sections of reinforcing bar. A similar arrangement ties the slabs to the pile caps. The corrections are completed by grouting.

The slabs are set on the pile caps in cutouts that accommodate the girders—the cutouts being four inches deep and 22 inches wide. Here again was a call on ingenuity.

Normal procedure would have been to place the slabs in the cutouts, then jack them up to final alignment before grouting.

Hand's men worked out a simpler scheme: In casting the pile caps, they also cast into the cut-out a small concrete plug, roughly 6 in. square, of the exact height of the finished job. The slabs were set on these plugs, and grout simply forced in around them. No jacking was required.

Other devices used to speed the work include the prefabricating of large sections of the fendering system —some of them of heavy timbers made up in lengths of as much as 80 ft— for placement by floating cranes and divers around the swing spans.

• **Other work**—As fast as MC&S completes piers and pile bents designed for steel girders, construction crews of the American Bridge Company move onto the job under a $3.9 million contract. Heavy steel girders, with spans up to 80 feet and 8 ft in depth are being used on high-level approaches to the bridges and trestle on the southern (Rockaway) end of the project.

American Bridge's contract also includes erection of steelwork for the two swing spans.

Meanwhile, other contractors are working on the site. Westinghouse Corp. of Pittsburgh holds a $3.5 million contract for supplying and installing power equipment; Fischback & Moore, Inc., has a $2.3 million contract for installing cable equipment; and other contractors will supply track equipment, signals and the like, to the tune of $6.4 million. Horn Construction Co. of New York is subcontracting bridge masonry under American Bridge; and Tully and DiNapoli of New York has just moved in to begin a $500,000 job of tracklaying and station construction on the filled section.

James H. Griffin is chief engineer for the Transit Authority, with Victor Lefkowitz as field engineer on job.

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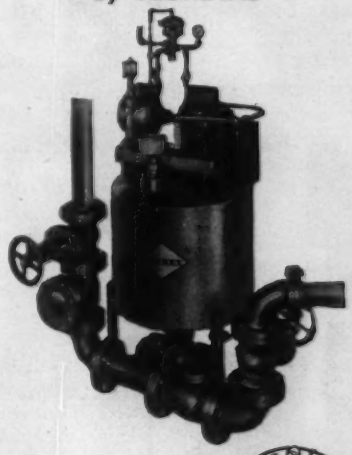

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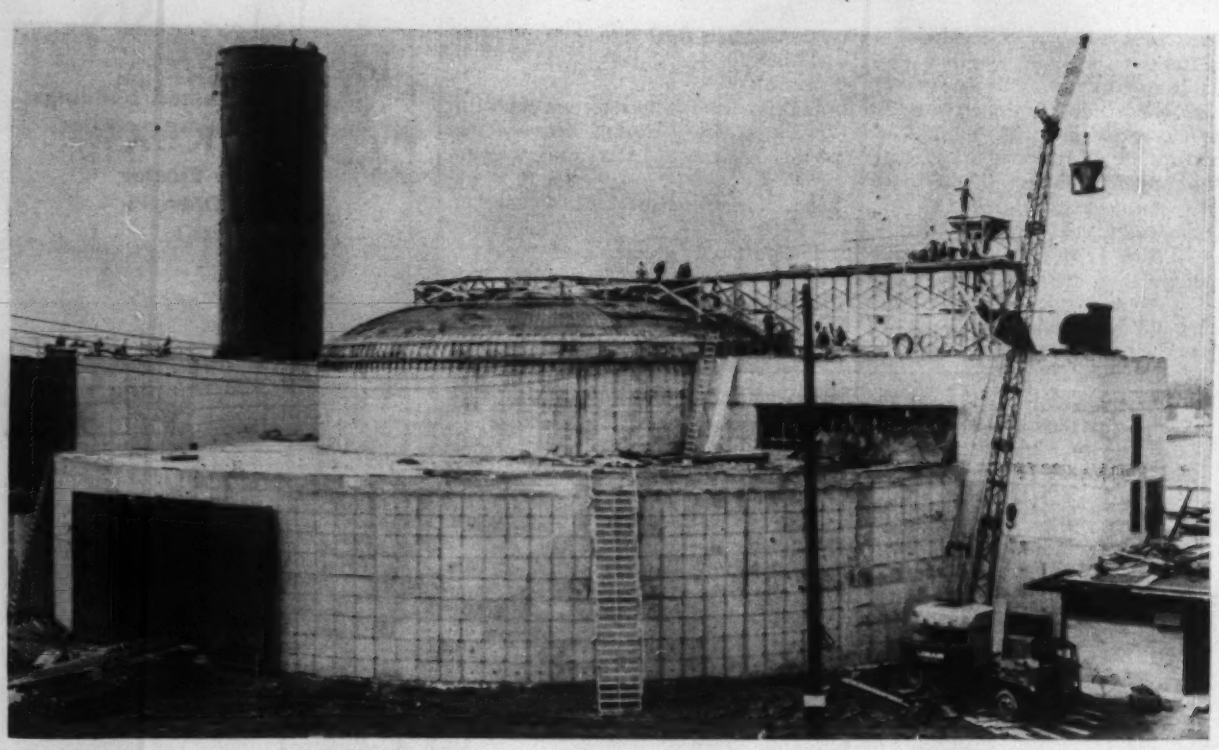


CIRCULAR STRUCTURE houses wind tunnels and a test cell where vehicles will be subjected to strong, hot desert-like winds.

Building for Vehicle Testing in Hot Winds

A unique structure is approaching completion at the Detroit Arsenal. Part of a $5.6 million Automotive Components Laboratory, it is known as a Controlled High Temperature Vehicular Test Cell.

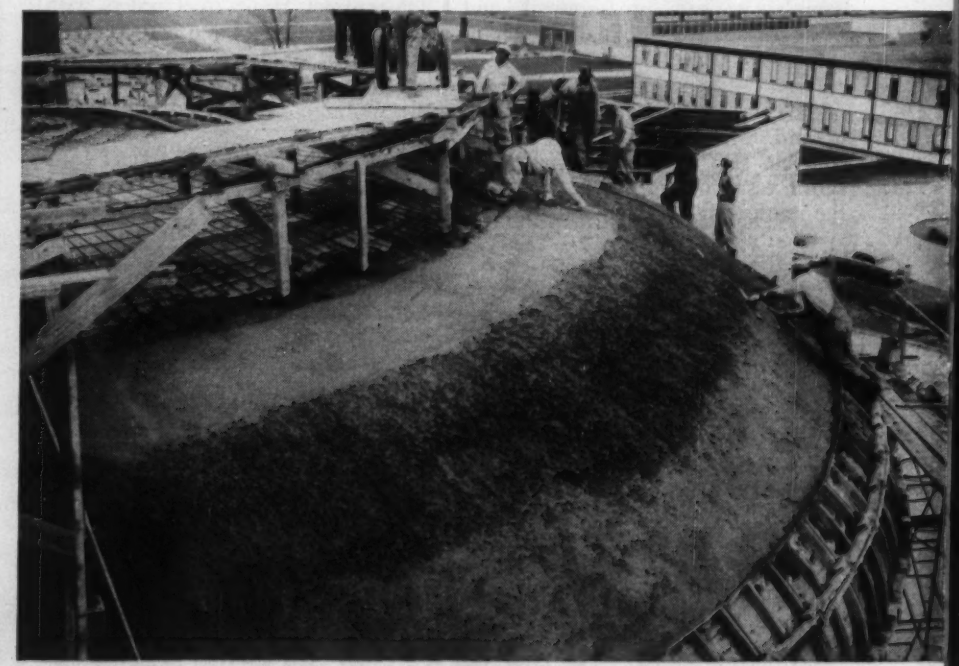
Purpose of the unusual building is to test vehicles and engines under temperature and wind conditions likely to be encountered in deserts. Air heated to as high as 150F will be forced through circular tunnels at speeds up to 20 mph. Vehicles to be tested may weigh as much as 100 tons and may be powered by engines that are capable of developing as much as 2,000 hp.

Among the novel features of the building are an arrangement of doors or movable walls, ventilator blades and vanes in the circular tunnels that will direct the heated winds into the test cell from several angles and a large reinforced concrete dome roof that can move upward.

• **Movable roof**—Roofing the test-cell section of the building, the dome is elliptical in shape, 80 ft. in diameter, with a rise of about 13 ft. Thickness of the shell varies from 5 in. at the crown to 18 in. at the edges.

The dome is only partly anchored with steel bars to the circular concrete building wall. So if an explosion should occur in the interior, the roof can rise slightly, relieving the pressure and thus preventing severe structural damage.

• **Adjustable wind tunnels**—If a turntable could have been used in the test cell for mounting test vehicles, design of the building would have been much simpler. Winds could have been directed into the test room through only one opening, and the vehicle could have been rotated for testing at



ELLIPTICAL DOME required forms only around the edge. It was designed to permit slight upward movement in the event of an explosion, to vent gases.

different angles. However, since about 500 connections have to be made to link the dynamometer to the vehicle, a turntable is impractical. Furthermore, the weight of vehicles and dynamometer equipment are relatively high for a turntable.

Consequently, vehicles will be mounted in a fixed position in the center of the steel cell, which is surrounded by two circular concrete ducts. To vary the wind angle, air will be directed from the ducts into the cell through any one of eight 20-ft-high by 27-ft-wide openings, while others are closed off with arc-shaped movable walls. Across the openings will be placed a fire damper and two sections of grilles, one with vertical blades to achieve horizontal spread of air and the other with horizontal blades to obtain a vertical spread—with this system a natural air-flow pattern is assured.

Four sets of portable 22x30-ft turning vanes with 8-ft radius will divert air flow in the ducts through an opening into the test cell. The vanes roll on casters in a slot in the floor of the ducts. When set in position, they are clamped to an overhead rail and to the floor. Then, a rubber gasket around the outside is inflated to assure a snug fit with the sides of the ducts. A 15-ton overhead crane, that moves on a circular track laid in the ducts, will shift the portable wall sections and vanes.

Air temperature will be raised by passing the air over 1,200 ft of steam coils, which can be supplied with 64,000 lb of steam per hour. To prevent the coils from freezing when the outside air temperature is low, the coils are interlocked electrically and pneumatically with the fans, so that if outside temperature is too low, the fans cannot be turned on.

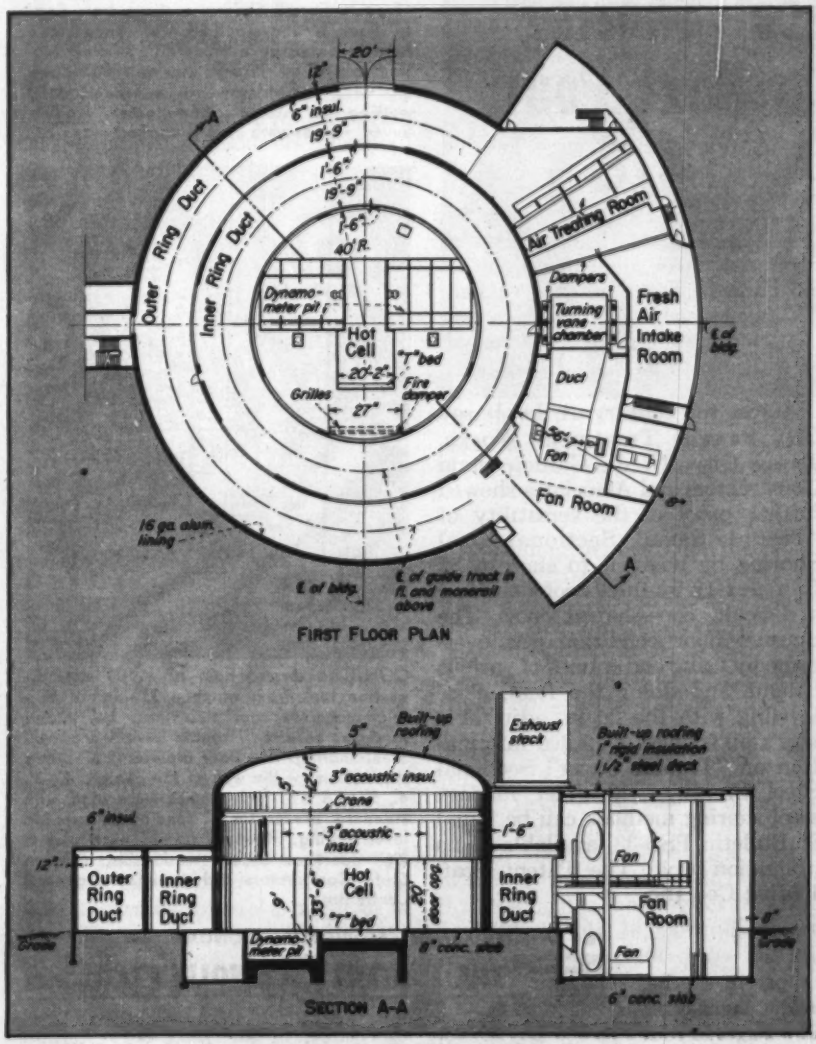
Products of combustion will be exhausted to the outside. The entire laboratory will be equipped with strategically located equipment for detecting combustible gas.

A control console in a control room 35 ft above the test cell will scan 400 variables during the tests.

Concrete used in the structure was a 1:2.1:3.30 mix, with 5½ bags of cement per cubic yard. Designed for a 28-day strength of 3,000 psi with 1½-in. maximum-size aggregate, it actually tested at 3,800 to 6,000 psi.

Forms for straight walls were 2x8-ft plywood panels set with the long dimension vertically. For circular walls, 30-in. square steel panels were used, with 2 and 3-in. wide panels, 30 in. long, inserted to make up the difference in circumferences of inside and outside surfaces. The dome required forms only at the edge, where the slope is steepest. There, the forms were made of 1x6-in. wood boards placed horizontally and braced with 2-in. thick verticals, cut to fit the curve, and pairs of 2x4 strongbacks.

H. E. Beyster & Associates and Leinweber, Yamasaki & Hellmuth, both of Detroit, are the architects. The project is being constructed under the supervision of the District Engineer, Detroit District, Corps of Engineers. A. J. Etkin Construction Co., Detroit, and Collins & Catlin, Inc., Port Huron, Mich., are the general contractors (joint venture).



TEST CELL is centrally located, surrounded by two rings of ducts. Movable walls and vanes make it possible to blow air into the cell from eight angles.

Plan Fall Bond Election For Two Hydro Projects

San Francisco will vote in November on a proposed $54 million bond issue for two hydroelectric plants to augment the supply of city power. At the same election, voters will decide on proposed bond issues for other civic improvements including $13 million for a court house, $7 million for improved park and recreation facilities and $11 million for off-street parking.

The hydroelectric plants would be the 81,000 kw Cherry Valley power plant on the Cherry River, in Tuolumne County, and the 54,000 kw Early Intake No. 2 on the Tuolumne River.

The $23.5 million Cherry Valley plant would operate in conjunction with Cherry Valley Dam, now under construction. Early Intake, a $23.7 million project, would utilize water from O'Shaughnessy Dam. Transmission system costs of $6.7 million are included in proposed additions to the city's Hetch Hetchy system.

The off-street parking program outlined by the San Francisco Parking Authority includes $6 million to acquire downtown parking sites which would be leased to private garage operators, $1 million for neighborhood parking facilities, principally for neighborhood shopping districts, and $4 million for a three-level underground civic center garage for 1,047 cars.

HORIZONTAL movement of three, two-frame high section of "Trouble Saver" Shoring to new pour area on the same floor is done with dolly equipped with pneumatic wheels and hydraulic jack. PS Co. supplied 4,730 5"-wide, 6'6" high frames for this multi-level shoring job.

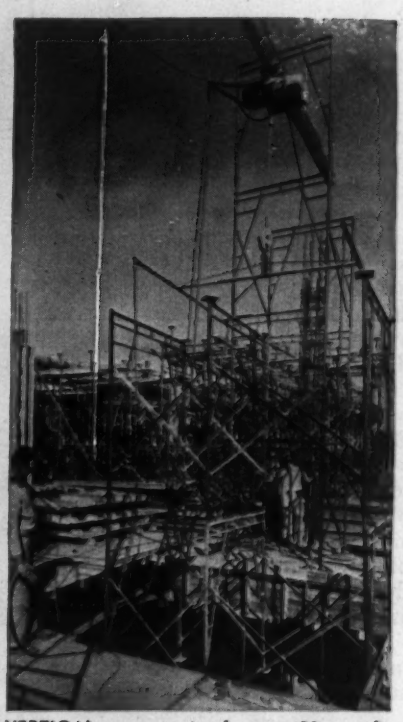
Sections of Steel Shoring Rolled, Lifted to Next Pour

IN ANAHEIM, CALIF., general contractor Ford J. Twaits Co. cut job time as much as 25 percent on the three-story, 330 ft. x 216 ft. Broadway-Hale department store by moving completely assembled sections of "Trouble Saver" Sectional Steel Shoring both horizontally and vertically. Here's how it was done:

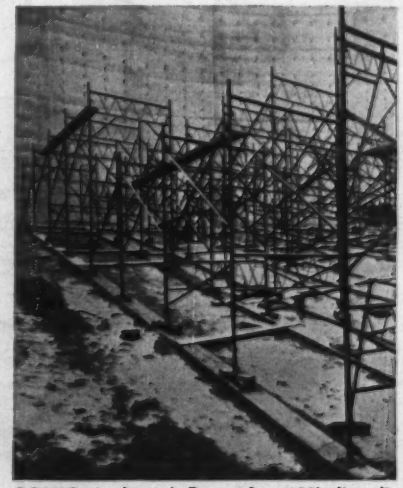
(1) The 5 ft. wide "Trouble Saver" end frames and diagonal crossbraces, supplied by PS Co., were assembled on the ground floor of the building. Maximum spacing between frames was 5 ft. The load bearing strength of each section was more than adequate for supporting the 8 in.-thick floor slabs. (2) After pours, the 30 sq. ft. shoring sections were transported horizontally to new pour areas on dollies equipped with 14 in. pneumatic wheels and a hydraulic jack. (3) When the next story was ready, the shoring sections were wheeled to escalator shafts or stairwells and raised to the next floor by a monorail-mounted electric hoist. The sections were again set on a second dolly and wheeled to the next pour area. After pours, the shoring sections were lowered from the forms by means of 20 in. extension legs.

The fact that "Trouble Saver" Sectional Steel Shoring could be moved with a minimum disassembly and assembly permitted unusually big pours of 550 to 660 cu. yd. at rates up to 93 cu. yd. per hour.

Across the country at the Jersey City Sewage Treatment Works, Jersey City, N. J., Garden State Constructors and Associates showed further proof of the versatility of "Trouble Saver" Sectional Steel Shoring by using it to shore a 32 ft.-high x 12 in.-thick roof slab from a difficult, cone-shaped floor. The unusual floor condition was overcome by using end frames of various heights and doing the final, close leveling with the 20 in. adjustable legs atop frames. Detailed information on "Trouble Saver" Sectional Steel Shoring and other modern steel shoring methods can be found in Bulletin PSS-33, available at no obligation from The Patent Scaffolding Co., Inc.



VERTICAL movement of same 30 sq. ft. "Trouble Saver" Shoring sections from floor to floor is accomplished with an electric hoist mounted on a monorail. Shoring sections are raised through escalator shafts and stairwells and released to a second dolly working that level. As shown, other "Trouble Saver" frames were used to support monorail.



CONICAL shaped floor of a 100' dia. digestion tank from which a 32'-high x 12"-thick concrete roof slab must be shored serves as base for "Trouble Saver" Sectional Steel Shoring. The floor dips to 12'6" below the bottom of the wall at the center. 2', 3', 4', 5' and 6'6"-high frames were used with standard braces for 5' spacing to provide level shoring. Rows of frames were placed 2'6" apart on braced wood sills. Garden State Constructors and Associates, general contractor.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

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National Homes:
Prefabber tools up for bigger sales

J. P. Chamberlain
Associate Editor

The prefab revolution, which one-time housing expediter Wilson Wyatt once hoped would solve the post-World War II housing shortage, has not yet arrived. Builders of prefabricated homes still sell only a small fraction of America's huge new-home market. But the prefabbers are getting old enough to be taken seriously. Many companies have been eliminated. The firms that remain are starting to lick their problems. Furthermore, prefab techniques have profoundly influenced the whole building field.

You are going to hear a lot more from the prefabbers over the next decade. In some communities, mainly in the Midwest, they are now building more than 50% of new homes. It seems quite possible that by 1965 they will be selling a much more new single-family homes than their present 7% of the total U. S. market.

PRESIDENT JIM PRICE and Hoyd Price, plant manager at Lafayette, talk over production schedule. National's capacity will soon double. By fall, its three plants should be able to turn out a house package every five minutes.

• **How much of the market?**—Their claim is that they will eventually be able to get nearly all of the $15,000-and-under market that is not being sold by mass builders like Levitt. The prefabbers believe the Levitt-type builder will not be able to operate outside of major metropolitan areas—and that they can compete even there. So they figure this leaves them a wide field of maneuver.

This seems too optimistic. It appears to be true that smart medium-sized builders who have adapted some prefab methods can compete with prefabbers on price. Some observers even think that efficient small builders can compete, because the field application of prefab methods is spreading all the time. The newest trend is the use of components, bought from manufacturers who specialize in making only one part of the house. This gives the flexibility—to satisfy individual tastes and meet changes in local markets.

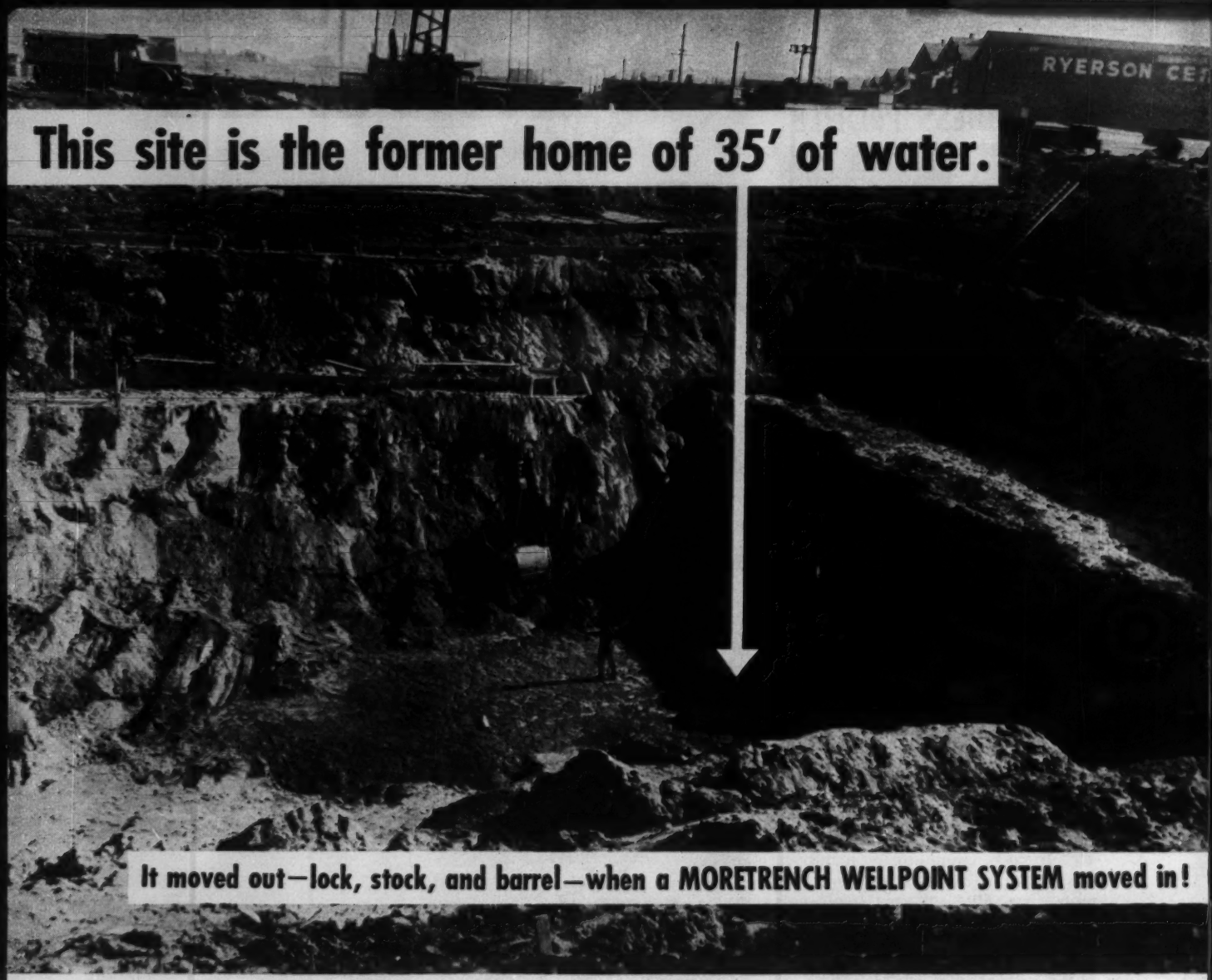
• **Expanding**—At any rate, the No. 1 prefabber, National Homes Corp., is gearing itself this year for bigger sales. By this fall, the company will have doubled capacity of its original plant at Lafayette, Indiana, to 150 units a day on a three-shift basis. It has a plant near Elmira, New York, with a peak production capacity of 50 units per day. And by fall a new plant at Tyler, Texas, should be in operation, able to turn out 90 units daily.

That would provide enough capacity to more than double the 30,000 units that National is shooting for this year. In 1954, it sold 20,000 units out of about 77,000 produced by the industry.

The company has considerably improved on its earlier designs and is offering models ranging all the way from simple two-bedroom homes to much larger units in "contemporary" style that would fit into any high-income suburb.

• **Fascinating Lafayette**—National's main plant at Lafayette, within 500-mile trucking distance of most cities in the U. S. heartland, is a fascinating place. Under roof, free from the weather, union workers turn out homes at about half the hourly wage rate of union construction workers in the area. New types of machines developed and built in the shop speed up the production process (pictures, next page). And it is obvious that home-building in the factory can be mechanized much further. Says National's production manager, Hoyd Price: "We've just scratched the surface."

Production capacity, however, is only part of the story. National's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Rapid Digging IN THE DRY Speeds Construction of Jersey City's Sewage Treatment Plant.

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. . . National Homes

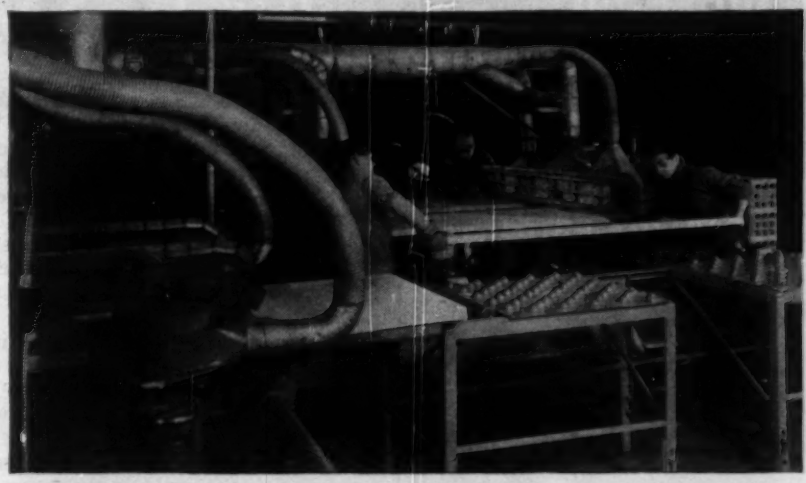
president and founder, Jim Price, has always been acutely aware that a prefabber can't succeed merely because he is able to turn out houses on a factory assembly line. Price started as a builder himself. He was a builder-dealer for Gunnison (now U. S. Steel Homes), then started National in 1940. He still owns a "showcase" National dealership in Lafayette.

• **Builder is key man**—Because of Price's experience, National has shaped the various stages of selling, producing, transporting, and erecting its homes into an assembly-line process. This assembly line starts and ends with the National Homes builder-dealer, who is in business for himself. The company picks its dealers primarily on the basis of management ability rather than building experience, though such experience helps a lot. The success of a prefab company depends very largely upon the ability and financial strength of its dealer force. This is what National and other prefabbers are striving to build up.

The builder-dealer needs a minimum of from $20,000 to $25,000 capital to be able to buy or get options on enough land for about one year's sales, and for development. Naturally, the most economic operation is to acquire land as a unit for tract development. (There are dealers who have been able to make out by building on scattered sites which they have bought, or by building on buyers' sites—in this way they have avoided taking on development costs.)

• **Developing**—Ideally, the dealer should be able to buy a large tract, because his development is going to boost the price of surrounding land. It will take from six months to a year to develop some of this land, before the dealer can start selling homes. So the size of his operation will depend on how much capital he has. But National argues—and many builders agree—that a builder acting as prefab dealer can turn his capital over faster than through conventional methods. Anyway, he will have to decide in advance how many homes he should plan to build annually: 20, 50, 100 units, or whatever.

• **Selling**—Having developed some of his lots, the dealer puts up one or more demonstration homes at his own expense. Working with the advice of National field men, he holds an "open



DOUBLE-END TENONER SAW can make up to 23 different cuts. Here it is sizing doors. Much National Homes production equipment is designed right in the plant.

HIGH-SPEED MACHINE drills and routs for the hardware that will be fitted on doors before they go to the final assembly line.

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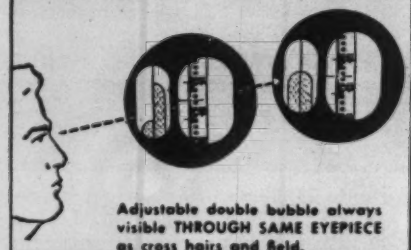

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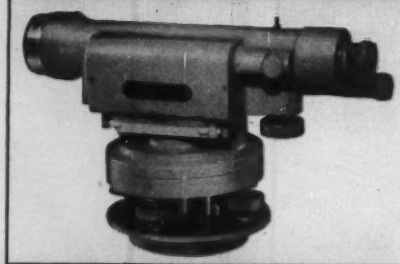

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house" to get orders. Or he may tie in with countrywide "open house" showings which take place two or three times a year, backed by national advertising in consumer magazines and by promotion. Very often, these open-house periods produce enough orders to carry the dealer through to the next national showing.

The company advises dealers not to sign up more prospects than they can build homes for over the next six months. This is partly because it doesn't want customers to get too impatient, and partly because it doesn't want the dealer to be embarrassed by possible price boosts. For instance, a 1% price boost takes place September 1 on the cost of the house "package" which National sells the dealer.

It should be understood at this point that the cost of this package will run only from about 30% to 40% of the home's final cost to the buyers. The proportion is highest with the lower-priced models. Of course, final prices charged by dealers will vary with local cost conditions and because of differences in how they run their business. National makes no attempt to set what will be final price, but instead suggests a 10% profit markup, which is added to direct house costs and overhead.

• **Prices**—How do Nationals compare on price with custom-built homes and with units built by tract builders who do not use packaged houses?

You will get a lot of varying answers on that—nothing very firm, because of the competitive nature of the business and because prices vary widely with differing local cost conditions. National itself cites a 1952 survey of seven major marketing areas by James C. Downs, Jr., a Chicago real-estate analyst. Downs concluded that on the basis of "true comparable value" Nationals were then selling at a price advantage of from 5% to 15% over homes built by other methods. On the other hand, many medium-sized tract builders today claim they can provide as good a product at a competitive price.

• **Financing**—As soon as the National dealer gets firm orders, he must arrange for financing. Often he is able to get local construction money and to place his mortgages locally. However, if necessary National's financing subsidiary, National Homes Acceptance Corp., will provide financing for the package and for construction and will resell the mortgage paper to final investors.

It takes about two or three weeks to arrange an FHA or VA insurance commitment through Acceptance Corp., which does not handle conventional mortgages. And it takes about the same or possibly a little longer through a local lender, depending on how well the local lender is set up to process mortgages.

Here's how Acceptance Corp. arranges financing. The dealer prepares an application for FHA or VA and sends it along to Acceptance with other required data. The company processes the application with FHA or VA. It also gets an advance commitment from the final investor before it makes the loan.

After receiving a mortgage, a certificate of title, and a fire-and-extended-coverage insurance policy from the dealer. Acceptance checks the title and closes the loan. Pay-outs can be arranged in stages corresponding to FHA and VA inspections. If the dealer wants a construction loan—and he usually does—Acceptance pays National Homes the price of the package and freight charges when the package is shipped to the dealer.

• **An example**—An example will show how this works. Assume that on a house and lot that will cost the buyer $10,000, the dealer can arrange a $9,000 loan and mortgage. The price of the package for this particular model is $3,500, and freight charges happen to be $150. Acceptance will make a 50% "first draw" on the construction loan, or $4,500, from which it deducts the $3,650 it has paid National Homes, leaving $850 for the dealer. After the second FHA or VA inspection (when the house is under roof and plumbing and wiring have been roughed in), a 25% draw is paid to the dealer. He gets the last 25% after final inspection of the completed house. Acceptance charges 5% on the construction loan, plus a flat service charge ranging from 1% to 1½%. These terms compare favorably with what the dealer can get from local lenders.

Let's assume that our National dealer has bought five acres of raw land for $1,500 per acre. He has developed two acres at a cost of $7,500 an acre before he started selling houses. (These costs, of course, vary widely.) He has subdivided into four lots per acre. So he has tied up $2,250 in each developed lot, besides what he has invested in the undeveloped land. This makes a total of $2,250 for his first lot. He gets $850 from Acceptance on his first draw after the package and freight have been paid for, thus freeing part of his working capital. It may be two or

"The Steel Service Couldn't Have Been Better"*

Workmen tie Connors' Rebars in place to form skeleton of a mammoth, 100 ft. dia. digester tank.

Connors' service in supplying the concrete reinforcing steel for the $4,000,000-plus Jefferson County Sewage Treatment Plant has won high praise on all counts from the builders.

The statement quoted above was made by Mr. J. L. Cobb, Manager of the Building Division of Sullivan, Long & Hagerty, General Contractors on the project.

All rebar deliveries have been timed to fit job progress exactly. "No steel 'pile ups' and no 'waiting' has really made our job easier," report the contractors. "Fabrication has been 100% accurate in every case, too."

For service that "couldn't be better" on your next order for steel, specify Connors . . .

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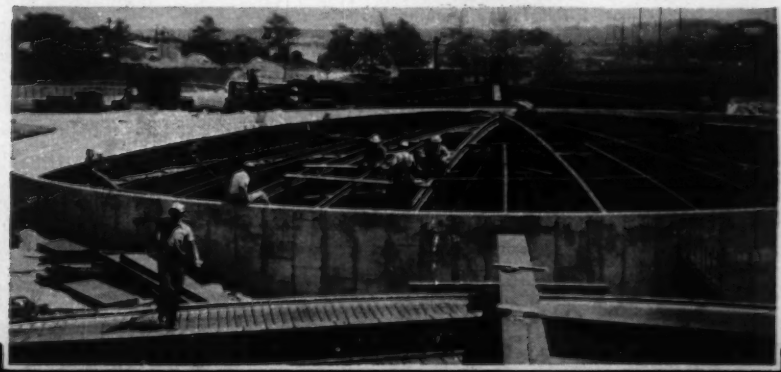

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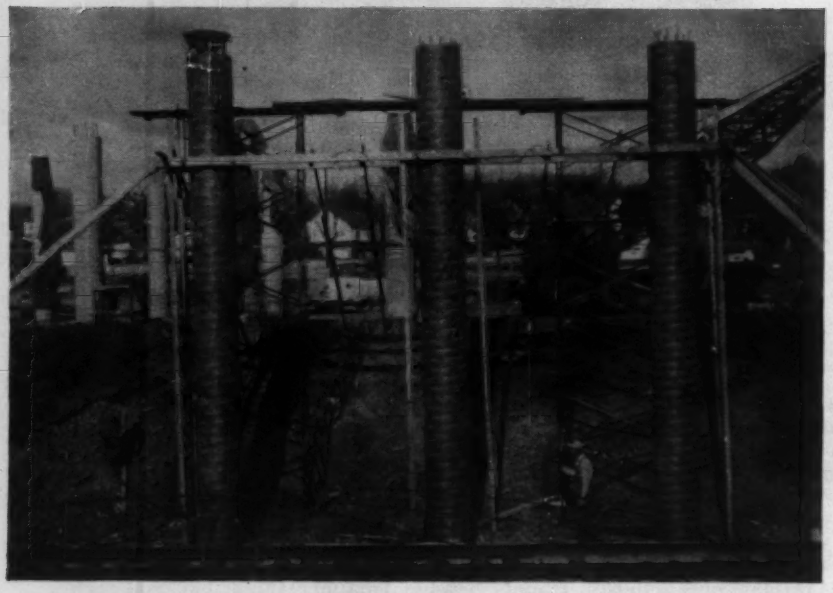
SONOTUBE®

FIBRE FORMS

for round columns of concrete



Railroad and Highway Overpass, near Kansas City, Kansas. State Highway Commission of Kansas, Bridge Department, designers L. G. Barcus & Sons, Contractors.

Round column piers save money!

. . . low cost SONOTUBES® make it possible

This railroad and highway overpass, designed by the Bridge Dept., State Highway Commission of Kansas is supported entirely by round columns of concrete formed by low cost SONOTUBES. Another Sonoco product, SONOVOID, was used in the construction of the bridge deck.

SONOTUBE Fibre Forms are particularly well suited for use with elevated structures of all types because they can be sawed to specific lengths on the job to fit the profile of the ground surface. SONOTUBES save time, labor and money . . . require minimum bracing.

Low cost SONOTUBES are available in 26 sizes, from 2" to 36" I. D. up to 50' long.

Use Sonoco's patented "A-coated" Sonotubes for finished columns; wax coated also available.

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for complete technical data and prices, write

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three weeks from the time the package is delivered until he gets the last installment of the construction loan by finishing the house. At that time he is able to turn the home over to the buyer and get the rest of his money out.

• **Erecting the house**—It usually takes only one day to put up the house, with its rooms structurally complete, but finishing takes longer. The quicker a dealer can finish, the faster he can turn over his capital. Some dealers can cut the time as short as 15 days. The dealer may in some cases subcontract certain part of the work—for instance, plumbing, electrical installation, or heating.

This dealer plans to build about 20 homes a year. So within about two weeks after delivery of his first package, he should be getting another one and repeating the whole process. Of course he can arrange for financing of several homes at a time, but it is important for him to stagger deliveries if he is going to use his working force to best advantage and keep costs down. Furthermore, if he tries to do too many at once, he will tie up his working capital. National, incidentally, strongly recommends that its dealers stay away from speculative building, except for one or more model homes. And it requires cash payments or the equivalent before shipping a package to the dealer.

As the dealer continues to sell off his developed lots, he should be working ahead on development of more lots, and eventually buying more raw land. To keep costs down, he has to maintain a fairly continuous flow of operations. He can't leave men idle, and he can't have more workers than he can use.

• **Limiting factor**—Obviously, the big limiting factor on a mass-production operation of this kind is the amount of capital needed to buy and develop land. The small builder in our example invested more than $22,000 before he even put up a model home. The average National dealer builds close to 40 homes a year—about double the goal set by our imaginary builder. A large-scale dealer putting up, say, 300 homes annually would have an investment of several hundred thousand dollars.

One possible way of avoiding this large investment is to arrange for options on land. And some dealers, as already mentioned, buy scattered lots in already-developed areas, or build on customers' lots. But they are generally small operators, faced with the serious

problem of keeping their costs in line with project builders.

Still another obstacle to widespread development of prefabs in many areas is the simple lack of available raw land, unless a builder is big enough to move out some distance and develop a whole community.

• **Acceptance Corp.**—However, the financing problem is pretty well worked out as far as construction and mortgage financing are concerned. The key to this is National's Acceptance Corporation. It is currently handling about half of the financing behind the sales of National homes. This percentage may range from 20% to 75% at various times.

Acceptance is prepared to furnish up to $35 million of temporary financing at any one time. It has a line of credit for that amount with five commercial banks, including nearby Indiana National at Indianapolis, First National and American National in Chicago, backed by First National City and Chase Manhattan in New York.

By depositing its FHA and VA paper with American National, Acceptance may borrow up to 95% of face value to provide construction money to dealers. As the homes are built, mortgages are transferred to the final investor who has agreed in advance to take them. About 150 investors hold mortgages processed through Acceptance, including life insurance companies, most of the largest savings banks, and the Federal National Mortgage Association. About 75% of these mortgages, totaling about $150 million, are now serviced by Acceptance for the final investors. This makes Acceptance one of the biggest mortgage companies in the U. S.

• **Code headaches**—Next to building a dealer organization and financing sales, probably the biggest headache prefabbers have had in the past has been caused by local building codes.

"Yes, we've had trouble with building codes," says Clifford Smith, National's young vice president and controller. "We're OK when it's a performance code. Nationals are approved, for instance, by the Building Officials Conference of America, the Pacific Coast Building Officials Conference, the Southern Building Code Conference, and the New York State Building Code Commission."

"In the East, where specification codes exist in some places, we do have problems. But that's only a small percentage of the more than 3,000 communities in which we are building." National has found that a careful educational job in specification-

SONOTUBE®

FIBRE FORMS

for round columns of concrete

Sewer Line, Springfield, Ill. William Newlin, design engineer; Allied Contracting Co., contractors. Photo by John C. Newlin

Money-saving "trestle" for pipe line!

. . . low cost SONOTUBES® make it possible

Low cost SONOTUBES were the forms for these round columns of concrete which carry an 8" cast iron sewer pipe over a 306-foot wide ravine!

In the center of the span the columns rise 26 feet above the ground. SONOTUBE Fibre Forms of 8" I. D. were quickly erected with minimum bracing atop square concrete footings.

For all types of piers, underpinning and columns. SONOTUBES provide a method of forming round columns of concrete which saves time, labor and money. Available in 26 sizes, from 2" to 36" I. D. up to 50' long. Can be sawed on the job to your requirements or ordered in specified lengths.

Use Sonoco's patented "A-Coated" Sonotubes for finished columns; wax coated also available.

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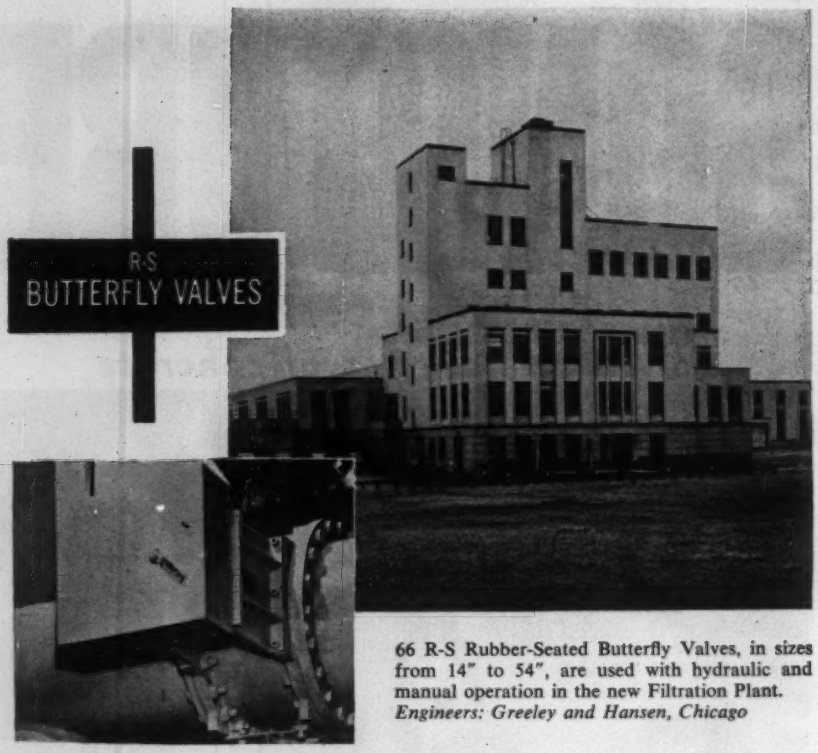

66 R-S Rubber-Seated Butterfly Valves, in sizes from 14" to 54", are used with hydraulic and manual operation in the new Filtration Plant. *Engineers: Greeley and Hansen, Chicago*

NIAGARA FALLS, N.Y. RELIES ON RUGGED R-S RUBBER-SEATED BUTTERFLY VALVES

The new Niagara Falls Pumping Station and 32 MGD Filtration Plant is one of the few big plants in the country almost entirely equipped with butterfly and cone valves. At this Filtration Plant, for instance, 66 R-S Rubber-Seated Butterfly Valves were specified for their ability to provide drop-tite, shut-off compactness and ease of operation. Satisfactory performance since the plant began operation in 1953 has resulted in an additional order of 42 R-S Rubber-Seated Butterfly Valves to rehabilitate the old Niagara Falls Filtration Plant.

Positive closure is assured by the wedging action of the valve disc periphery against a tough, flexible rubber seat, which seals the shaft bosses as well. Specially compounded rubber defies abrasion and resistance to the flow of materials for longer valve life.

If you would like to benefit by the design advantages and economics available in our complete line of butterfly, cone and ball valves, contact our local representative or write S. Morgan Smith Company, York, Penna.

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AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

code communities generally meets objections.

• **Union troubles**—And, of course, prefabbers have their troubles with local labor unions. However, National says it has never found labor resisting the house package. It has run into trouble though, on the plumbing and wiring packages that are optional with some 1955 models. Still it has been able to sell these supplemental packages on about 70% of the units for which they are available.

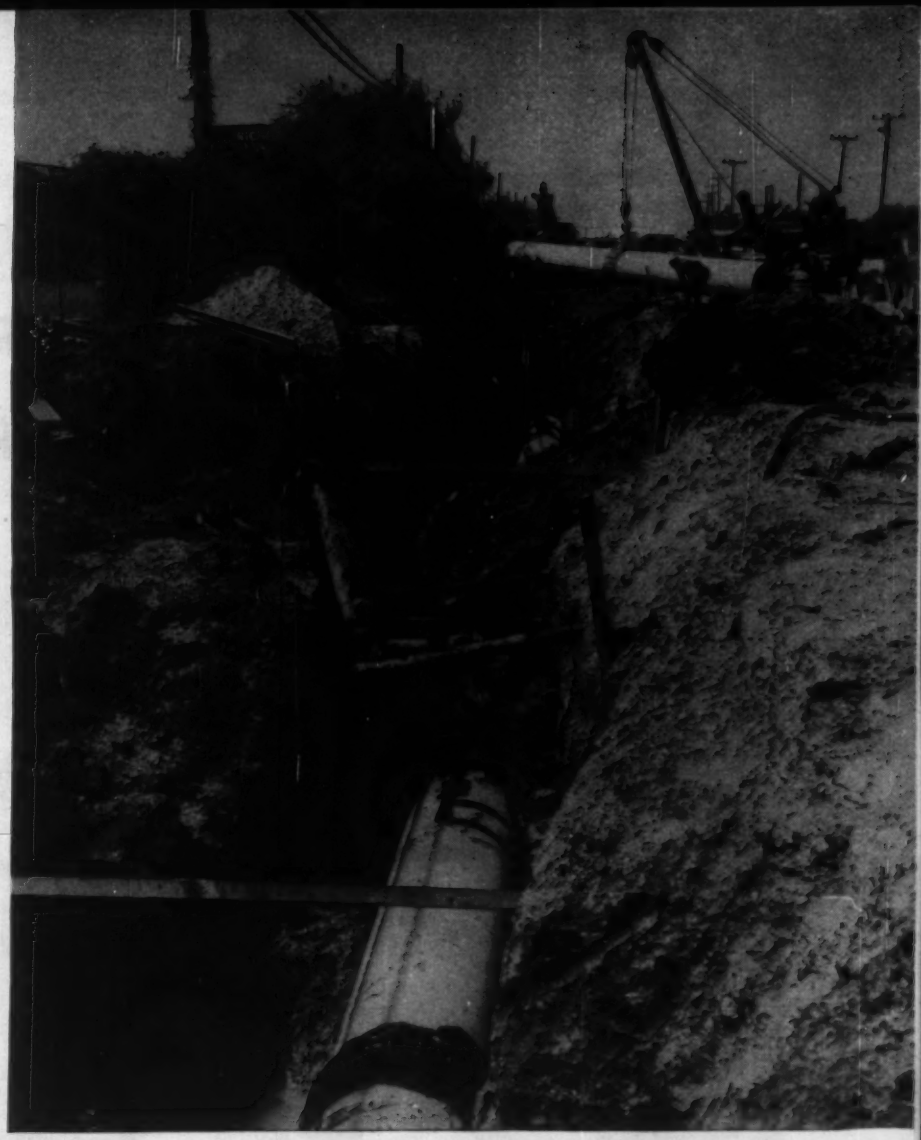
Tied in with code headaches and labor problems is another stumbling block: the question of consumer acceptance of prefabs. This has been partly overcome by more attractive models, plus consumer advertising and promotion. National offers more than 30 basic floor plans and 200 exterior variations. It stoutly maintains that "the average buyer of a conventional home doesn't get as much special architectural attention as we give him." It means by this that because it turns out houses by the thousands it can afford first-rate architectural advice.

• **Psychological** obstacle—National's steady rise in sales is proof that opposition to prefabs is declining. But it will still have to buck the widespread desire among home buyers to make little changes in standardized house plans that make the home peculiarly their own. And it is easier to get these on-the-spot changes from tract builders who build conventionally.

Although National is far out in front of other prefab manufacturers now, this situation could change rapidly. Its biggest potential threat is U. S. Steel Homes, Inc., at New Albany, Ind., which as a subsidiary of one of the major U. S. corporations could become very stiff competition. Harnischfeger Corp., of Milwaukee, has big expansion plans for its houses division. Lumber Fabricators, Inc., at Ft. Payne, Ala., is another well-established builder. Among many others that might be mentioned are American Houses, Inc., of New York City, and Page & Hill Homes, Inc., of Shakopee, Minn.

There will be ups and downs among the prefab firms. And perhaps they may face increasing competition from makers of packaged components. Many builders may prefer to use prefab methods as much as possible, buying components, competing by flexibility and perhaps on price, too. In any event, the prefabbers—and their No. 1 company, National Homes—are going to be worth watching.

DELIVERING WATER CHEAPER



HOUSTON, TEX.

Lockwood & Andrews engineered this 37,920-foot Dresser-Coupled steel line to alleviate water shortages in rapidly growing East Houston. Installed by George Consolidated, this 36-inch steel line was laid under varied and unfavorable conditions, with cover ranging from 3½ to 13 feet.

Water Stays In...and Out

DRESSER-COUPLED STEEL LINE INSURES AGAINST WATER LOSS AND INFILTRATION

Running silt, shifting sand, water from a nearby ship canal... three good reasons why Houston specified steel water pipe joined with Dresser Couplings.

City engineers bought, in effect, a "packaged pipe line"—easy to lay out, easy to install, accurately predictable as to cost.

And despite adverse conditions, the job proceeded smoothly. Long, strong lengths of steel pipe—lighter in weight and requiring fewer joints—cut down installation time. Dresser Couplings made joining fast and simple. Bottle-tight sealing gave 100% assurance against leakage at the joints or possible ground water infiltration in the event of pressure drops.

Looking to future economies, the picture is equally bright. A Dresser-Coupled steel line is virtually indestructible, free from costly maintenance. It's a sound, secure, long-term investment in *delivering water cheaper.*

Gasket and follower ring were put on outside ditch.

√ *Wherever water flows, steel pipes it best.* Always put steel pipe and Dresser Couplings in your specifications.

DRESSER®

15th ANNIVERSARY THE DRESSER WAY 1940-1955

Dresser Manufacturing Division, 69 Fisher Ave., Bradford, Pa. (One of the Dresser Industries). Warehouses: 1121 Rothwell St., Houston; 101 S. Airport Blvd., S. San Francisco. Sales offices also in: New York, Philadelphia, Chicago, Toronto.

RIVETS

EVERY TYPE
EVERY SIZE

If you are shopping around for rivets, to help keep your steel erection program in high gear, get in touch with Bethlehem. For we turn out rivets in every conceivable style and size, making it easy for you to get exactly what you need.

SMALL RIVETS: Diameters 7/16 in. and smaller. Lengths 6 in. and shorter. Button, cone, countersunk, pan and flat heads.

LARGE RIVETS: Diameters ½ in. to 1¾ in. Lengths 2 in. and longer, in steps of ⅛ in. Button, high-button, countersunk, round-top countersunk, cone and pan heads. Also furnished with swell neck.

BETHLEHEM STEEL

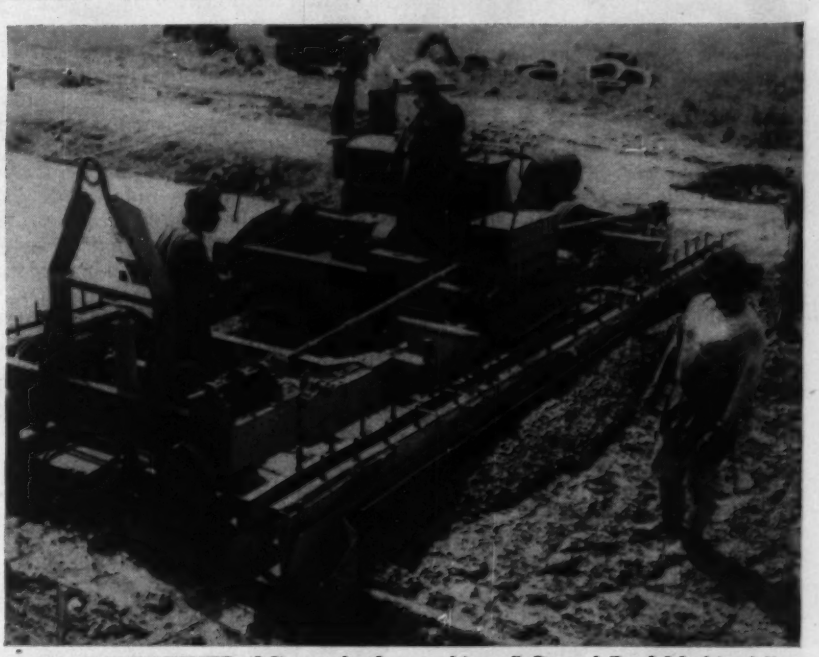
BETHLEHEM STEEL

New Firm Unveils Road Machine Line

When General Road Machines, Inc. was formed (ENR April 14, p. 122), it was not generally anticipated that any appreciable production could be achieved before the end of the year. But, now the young company announces that its present product line includes subgraders, automatic curing machines, mechanical curb builders, compacting screed finishers, final finishers, and road and airport forms. Scheduled for production before the close of the present construction season are a subgrade testing machine, concrete spreaders, joint machines, cap strips and rolling and power bridges. Further, it is estimated that by early 1956 a full line of bins and batching plants will be available.

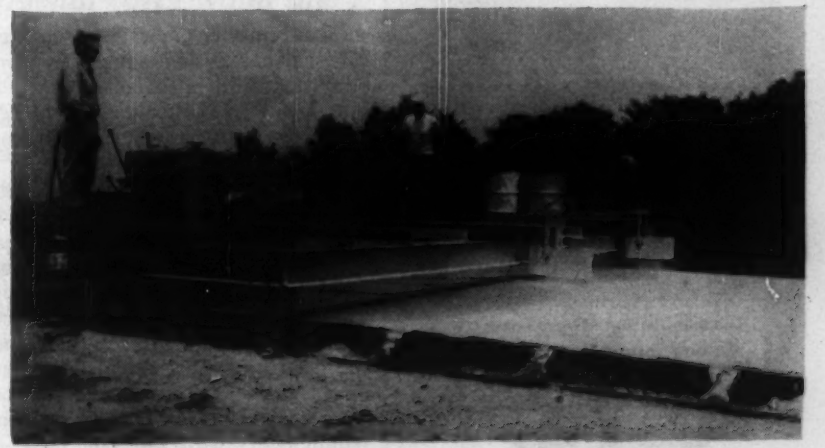
• **Finisher first**—The first product to come off GRM's production line was the compacting screed finisher. This machine features 16-in. screeds, and on-the-job experience reportedly indicates that it is capable of one-pass performance. Two models are being produced—No. 5-S, a portable machine with telescopic width adjustments from 10 to 25 ft and No. 4-S, a non-portable machine, also adjustable in width from 10 to 25 ft. Twisting and rocking the form line has been a constant road finishing problem, but the new finisher is said to operate smoothly with a minimum of side sway to eliminate the wear and tear which road forms usually sustain. According to the manufacturer, the finishers' speed selectivity of six forward and six reverse speeds plus four independent screed speeds cause the machine to crowd the spreader, setting the pace for more footage per day.

• **Planer second**—Close behind the finishing machine on the company's production schedule came a completely adjustable subgrade planer. Featuring multiple telescopic and vertical adjustments, the subgrader is made in two models with telescopic widths from 10 to 15 ft and 20 to 25 ft. Both models can provide vertical settings up to 16 in. Slotted holes on the grader blades and positioner plates are said to allow simple, yet accurate settings, while the large front wheel screw adjustments permit minute thicknesses of slabs. In addition, the

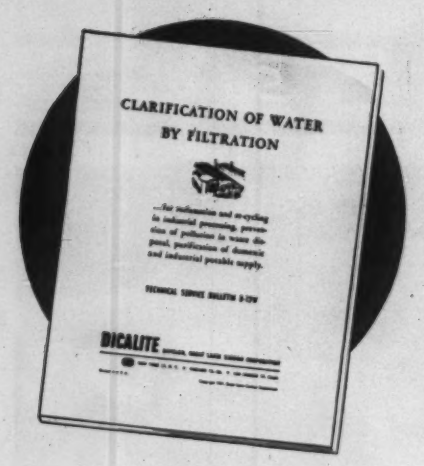


PORTABLE FINISHER (5-S) was the first machine off General Road Machines' line.

NON-PORTABLE FINISHER (4-S) has telescopic width adjustments from 10 to 25 ft.



CURING MACHINE features windbreakers around the traversing spring nozzles.



These FREE Bulletins provide much valuable data on WATER FILTRATION

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Dicalite Division • Great Lakes Carbon Corporation, Dept. E
614 South Flower Street
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rear wheels have a four-step pin lift for vertical alignment.

• **Curing machine third and current**—The curing machine, now coming off the production line features standard 10-15 ft and 20-25 ft with adjustments. Its heavy gauge, steel construction reportedly provides a durable, non-vibrating unit that is fully telescopic by means of adjustable end-frames. Track wheels may be either single or double flanged, or flat-faced rubber-tired according to customer's specification.

The machine is powered by means of a 12-hp, 2 cyl, gasoline engine geared to oversized transmissions. It offers four speeds forward and four reverse with instant reversing action under load. Traction speeds are: 7.6, 16.3, 32.4 and 65 fpm at 1800 rpm engine speed, forward and reverse.

Steering clutches are standard equipment. Ball and roller bearings are used throughout.

In operation, the curing machine mounts on the form line behind the finisher and the 12-ft spray arms swing out over the fresh concrete in overlapping transverse arcs. These arms can inscribe from 1 to 20 cycles per minute to fit specific job conditions through hydraulic power controls. At the working ends of the spray arms are nozzles protected by windshields that are said to insure an even spray pattern under the most severe wind conditions.

The machine spreads wax or resin base materials, as well as the standard white, pigmented curing compound. The curing solution is pumped direct from 55-gal shipping drums through independent controls to each spray head. A bypass system keeps the material agitated in the drums.

Optional brooming, reciprocating-belt, and burlap drag attachments are available for mounting on the machine.

• **Final finisher now job testing**—GRM's final finisher is presently being job-tested. This machine combines in one unit, each of the mechanisms necessary to a great many types of concrete roads.

Following the final pass of the traverse finishing machine, three or four finishing requirements (plus joint, edging and curing operations) must be met. These final finishing specifications vary from state to state and from city to city within a state, but the new finisher is said to be a composite machine that enables road contractors to comply with all finishing requirements with but one piece of equipment.

GRM's automatic curb builder is now being delivered to the field; this device eliminates hand-finishing curbs. By hydraulic activation, it mechanically finishes integral roll type curbs.

At the same time as the machines were going into production, a complete line of concrete forms was being fabricated. The company is producing road forms of every type including a 4-in. sidewalk type, combination curb and gutter and a 17-in. double-purpose airport type. General Road Machines, Inc., Niles, Ohio.

Plastic Closure Strips Seal Corrugated Sheets

Pliable vinyl plastic closure strips are being produced in colors for use with corrugated sheets.

The closures are made in both horizontal and vertical strips, in standard 2½ x ½ corrugations, and are said to be soft enough to form a water-tight and air-tight seal in any corrugated sheet material installation. Made in colors to blend with corrugated materials of coral, light blue, yellow, light and dark green, ivory and white, the horizontal strips are molded 34⅓ in. long; vertical strips are 36 in. long.

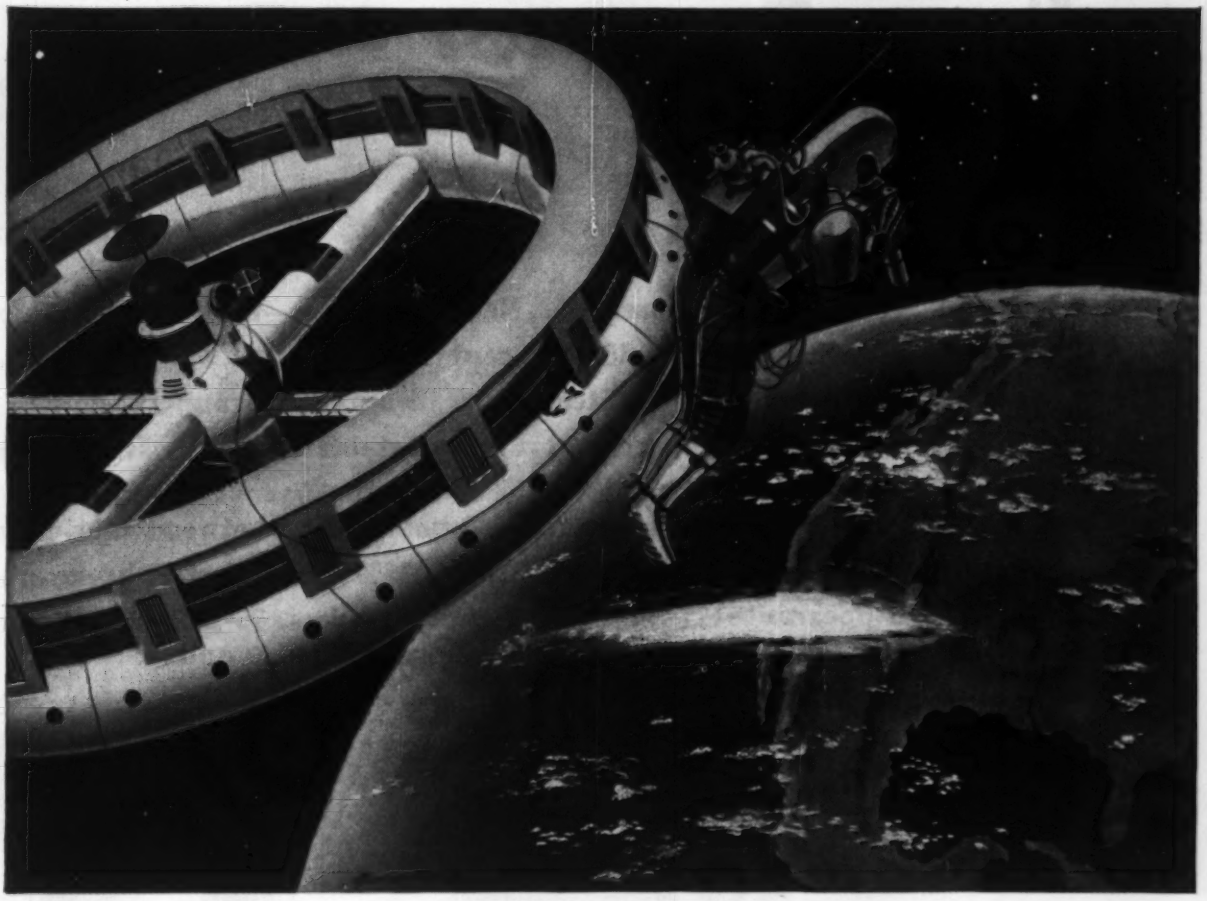
The closures can be fastened by nails, bolts or screws and form a seal around the shaft of any fastener. Flexibility of the material also takes care of expansion and contraction in glass fiber reinforced plastic sheet and other structural materials. They are reported to lose very little flexibility at 0 F., and can be successfully used even at temperatures as low as 40 below. Hanszen Plastics Co., 835 South Good, Latimer Expressway, Dallas, Tex.

Salamander Recirculates Gases to Provide More Heat

A smokeless type salamander is reported to burn less than a gallon of fuel per hour to produce 175,000 btu.

The principal feature is a specially designed circulator that drives the heat streams "in tandem." Unburned material and partially consumed gases rise up and out of the top of this circulator, then are down-drafted back and up again through the flames. Smoke, soot, fumes, gases and unburned material are thereby forced through the fire to squeeze more heat from the fuel. According to the manufacturer, smoke is eliminated because it is consumed in the heart of the heat core. C. R. Daniels, Inc., Daniels, Md.

(*New Products* continued on page 71)



A SPACE STATION . . . a thousand miles high in the stratosphere slowly circling the globe . . . observers near its rim studying cloud formations and the earth's atmospheric conditions below . . . this may be our weather bureau of the future.

100 years from now... A MAN-MADE "MOON" MAY BE OUR WEATHER BUREAU

OUR WORLD of tomorrow will bring many changes. But in one vital aspect of American living, your great-grandchildren will continue to enjoy the same dependability and service you know today. *Cast iron pipe laid today will still carry water and gas to their homes.*

Today, over sixty American cities and towns are still served by cast iron water and gas mains laid 100 and more years ago. And modernized cast iron pipe, centrifugally cast, is even stronger, tougher, more durable.

U. S. Pipe is proud to be one of the leaders in a forward-looking industry whose service to the world is measured in centuries.

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PIPE
FOR WATER, GAS & SEWERAGE AND INDUSTRIAL SERVICE
CAST IRON

United States Pipe and Foundry Company
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A wholly integrated producer from mines and blast furnaces to finished pipe.

New Increased Power International

NEW Power... New gearing... New ruggedness—for greater production

NEW Track Frames... 300 per cent stronger

NEW Finger-Tip Power Steering... advanced hydraulic design

NEW Operator Compartment... comfortable driver's seat—easy-to-reach controls

NEW Track Roller Oil Seals... 500-hour period between lubrications

NEW Positive Self-Energizing Brakes, 13% more effective brake area

NEW Appearance... sleek grille, heavy fenders, 75-gallon fuel tank. Better visibility... control-tower view front and rear

LOOK AT THAT LOAD as operator applies 103-drawbar hp of new TD-18A. Steering is effortless with new hydraulic finger-tip controls and positive, self-energizing brakes.

TD-18A Now with 103 Drawbar H.P.

Here's the crawler tractor with everything contractors need to meet increased competition—increased workpower, increased ease of operation, increased durability:

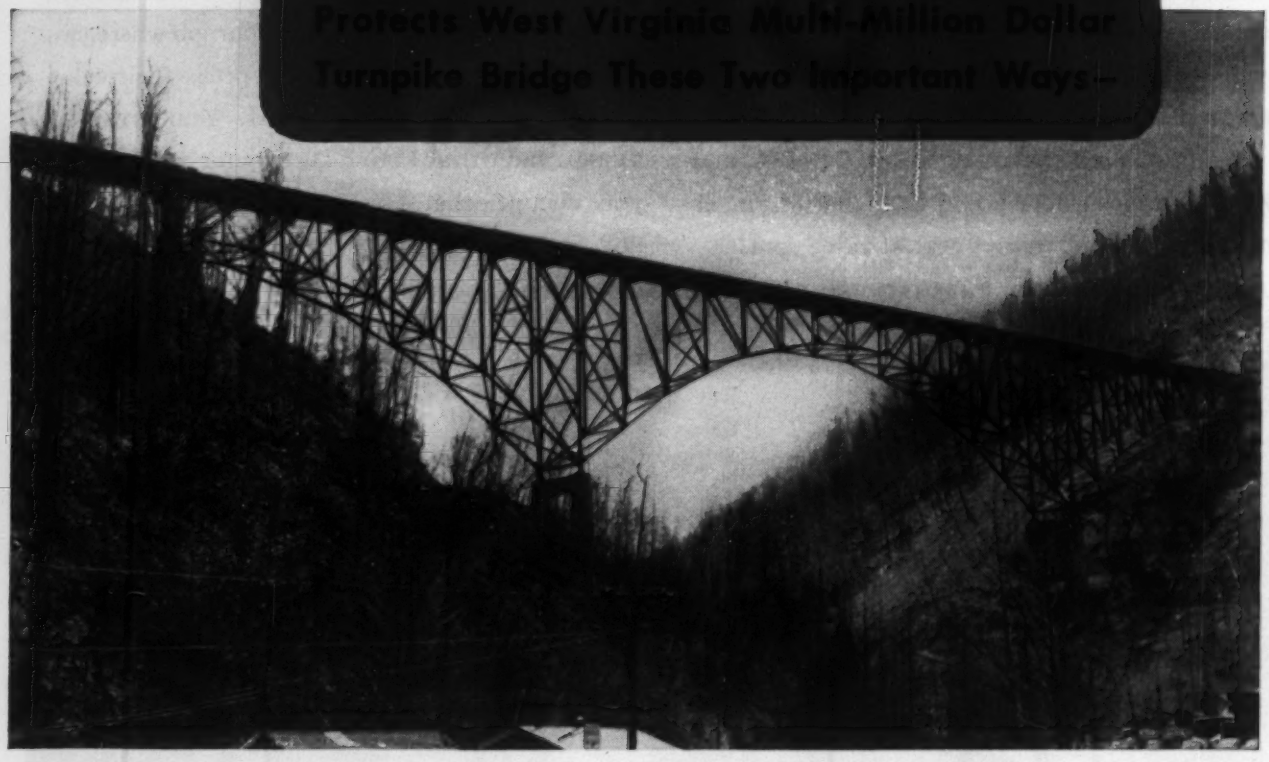
The improved INTERNATIONAL TD-18A, now with 103-drawbar horsepower at 24,300 lbs. maximum drawbar pull in first gear at rated rpm.

Double check all these great new TD-18A features—right here on these pages—on your job where you can take over the controls and appraise their value in extra work done for lower cost. Your INTERNATIONAL Industrial Power Distributor will arrange your own personal shake-down test of the TD-18A any time you say.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

Pittsburgh's X-L-O STRUCTURAL STEEL PRIMER

Protects West Virginia Multi-Million Dollar Turnpike Bridge These Two Important Ways—



1. Safeguards steel shapes against corrosion during shipment and erection

2. Makes an excellent foundation coat for field painting

ANOTHER impressive example of the double protection against corrosion which Pittsburgh's X-L-O Primer gives to structural steel is the multi-million-dollar bridge which spans the 287-foot-deep gorge of Four Mile Fork. This spectacular viaduct, second highest highway bridge in the United States, is a vital link in the 87-mile West Virginia Turnpike between Charleston and Princeton.

Steel work, fabricated by the American Bridge Division, United States Steel Company, was shopcoated with X-L-O Primer. This unusual material, derived from linseed oil, is available in combinations of red lead and iron oxide, or with 100% red lead.

X-L-O eliminates the need of costly metal cleaning operations. Its unexcelled wetting characteristics assure maximum penetration of surface pores and pockets and permit uniform coverage of surface irregularities caused by mill scale. Satisfactory through-drying of film within twenty-four hours, regardless of weather conditions, makes possible prompt shipment to job sites.

Besides protecting against corrosion in transit and during erection, X-L-O serves as an excellent foundation for field painting, for which Pittsburgh's IRONHIDE and METALHIDE are available in suitable colors.

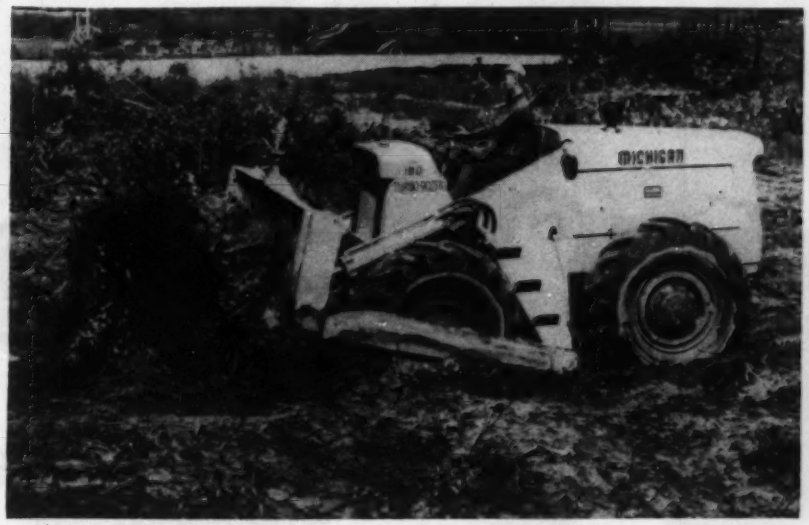
Our wide experience in supplying protective finishes for structural steel shapes of all kinds may save you time and money. Why not call on us for advice or suggestions? Write, wire or call Pittsburgh Plate Glass Company, Industrial Paint Division, 1 Gateway Center, Pittsburgh, Pa.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



DOZER BLADE may be tipped back and forth hydraulically to change digging angle.

Rubber-Tired Turbo-Dozer Travels at 27 mph

The first rubber-tired dozer powered by a turbocharged diesel engine has a 165 hp rating and a road speed of 27 mph.

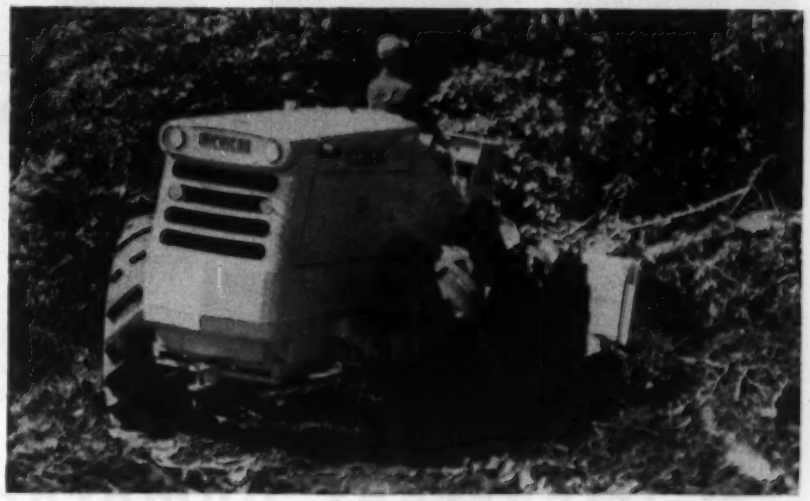
Among operational advantages claimed by the manufacturer are hydraulic controls for easier maintenance, a blade that can be tilted by the operator while the machine in in motion and an ability to move under its own power over the highways. Designated the Model 180 Turbo-Dozer, the unit features a power-shift transmission, a torque converter that provides automatically up to 3 to 1 torque multiplication and planetary wheel drive axles.

The dozer blade, which is raised and lowered by two double-acting cylinders, is tipped back and forth by a 6-in. double-acting hydraulic cylinder to pry out and lift boulders, uproot stumps, or change the digging angle of the blade from cutting to float position. Both ends of the blade are fitted with vertical cutting edges to slice through roots preparatory to knocking over trees.

The cutting edges of the dozer blade are replaceable and end bits are interchangeable to simplify maintenance. When the two corners have been worn, the two end bits can be reversed, side for side, to again provide sharp, cutting corners. There are two 1¼-in. dia holes for pusher block mounting.

Inclusion of a power-shift transmission as standard equipment elimimates the clutch pedal and permits the operator to shift from forward to reverse even while moving.

A locking differential in the front axle automatically applies power to whichever wheel has the firmest footing when one wheel begins to slip. The steering drive axle oscillates to maintain ground contact of all wheels on uneven terrain.



TURBO-DOZER is steered by rear wheels. This reportedly increases life of tires.

Final planetary reductions in the wheels reduce the torque load on axle shafts by 70% to eliminate wind-up and surge. Final reduction is as close as possible to the point where tractive effort is applied.

Four 18.00 x 25, 12-ply high-flotation tires and a wheel tread of 6 ft. 11 in. are said to give the Turbo-Dozer good traction and permit it to travel over highways and roads without damaging pavement. Rear-wheel steering reportedly increases tire life.

The Turbo-Dozer has vacuum-boosted four-wheel brakes for service use and two-wheel mechanical brakes, connected to service brake shoes in the front wheels, for parking. A 50-gal fuel tank permits it to work an average full day without refueling.

A swinging drawbar fastened to the center of the Turbo-Dozer's C-frame, well below the center line of the wheels, is positioned to allow connection to any piece of equipment that has to be pulled, such as a sheep's foot roller or a scraper.

Overall, the Turbo-Dozer is 8 ft 4¾ in. high over the air cleaner cap, 9 ft 9 in. wide at the blade and 17 ft 1 in. long with the blade vertical on the ground. Its wheelbase is 7 ft 4 in. and ground clearance is 14½ in. Weight is 27,000 lbs.

Production of the Turbo-Dozer is scheduled for September. CONSTRUCTION MACHINERY DIV., CLARK EQUIPMENT CO., BENTON HARBOR, MICH.

(*New Products continued on page 75*)

7 important Dumptor advantages

Take another look at the latest model Koehring 6-yard Dumptor shown here. It has some important features worth checking. Notice how heavy snubber-spring on steering axle cushions road shocks — yet retains Dumptor's unique advantage of no spring maintenance. There are no leaf springs. Big shock-absorbing drive tires eliminate need for springs on the drive axle.

Alignment of drive wheels with steering wheels adds to efficiency of Dumptor no-turn shuttle hauling — makes a big difference in traction and flotation when Dumptor is shuttling back and forth across loose stockpiles, soft ground.

Another basic Dumptor advantage is instant gravity dump. It's controlled by a simple body latch and new dump lever arrangement. Gravity dumping eliminates slow-acting, troublesome body hoists — never balks, never wears out. Notice, too, the new streamlined, all-steel body. Even with all this heavy-duty strength, Dumptor still has more than 6 h.p. for every ton of loaded weight. It accelerates fast, pulls through soft ground and up grades with less shifting — climbs 24% grades fully loaded.

Let your Koehring Distributor give you all the latest Dumptor® facts. See him soon, or write.

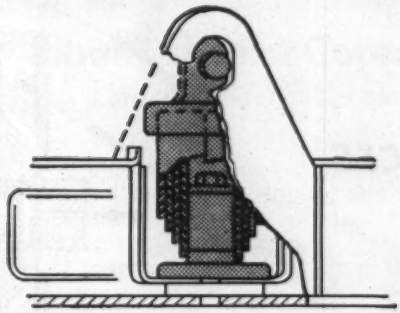
KOEHRING COMPANY

MILWAUKEE 16, WISCONSIN

KOEHRING HEAVY DUTY

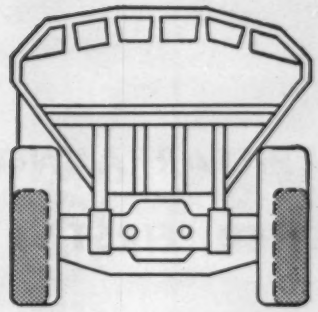
Subsidiaries: PARSONS • KWIK-MIX • JOHNSON

K437



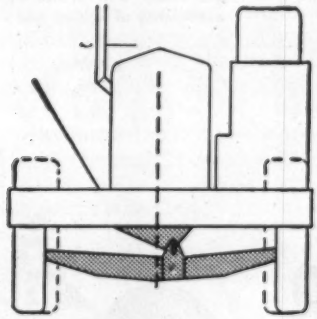
Smooth ride

Heavy, snubber-type spring is mounted between Dumptor main frame and the steering axle. Shock-absorbing action provides plenty of "cushion" — takes all the jolts out of rough, off-road travel. Easy on operator and machine.



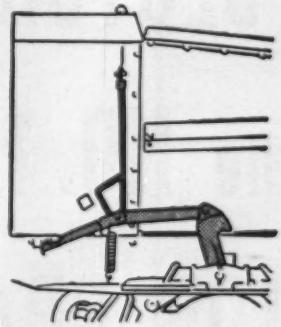
Tires track in direct line

Wider, heavier steering axle puts Dumptor steering wheels in direct line with big drive wheels. Tires track in the same path. There's less rolling resistance, better traction in soft ground, and on rough haul roads.



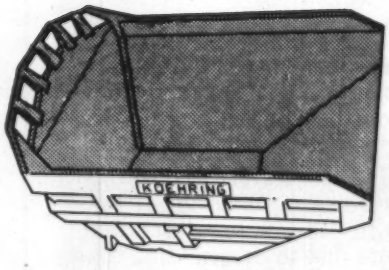
Off-set pivot on axle

Pivot point on steering axle is off-set from center line 3¼" toward operator side of machine. There's no sag, even with unbalanced load. Steering axle oscillates up to 21" — keeps twisting strains out of Dumptor main frame.



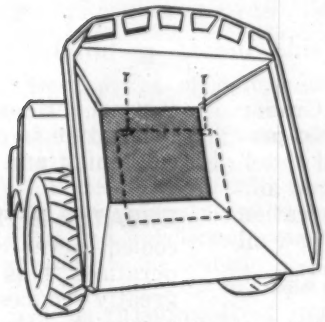
New body-latch, dump lever

Body latch for 1-second gravity dumping is simple, trouble-free. Latch is engaged by a single hook, mounted on the chassis frame. Dump lever is located inside the cab, in an easy-reach position to left of operator.



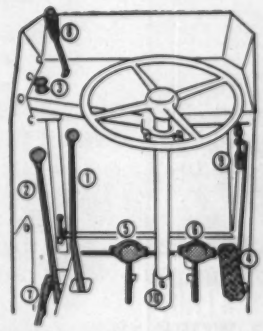
Streamlined, all-steel body

Inside is free of bulges or ledges. Top edge is box-beam constructed. Sides, ends are ribbed with 5 and 8" channels. Double-plate bottom is lined with multiple steel beams. Note ridge bar added to sturdy rock-guard teeth.



Bolted or free-swinging pan

Heavy steel kick-out pan is ½" thick. Pan can be bolted to body floor for extra protection when loading rock. Remove bolts, and pan has free swinging kick-out action — breaks suction when dumping wet or sticky materials.

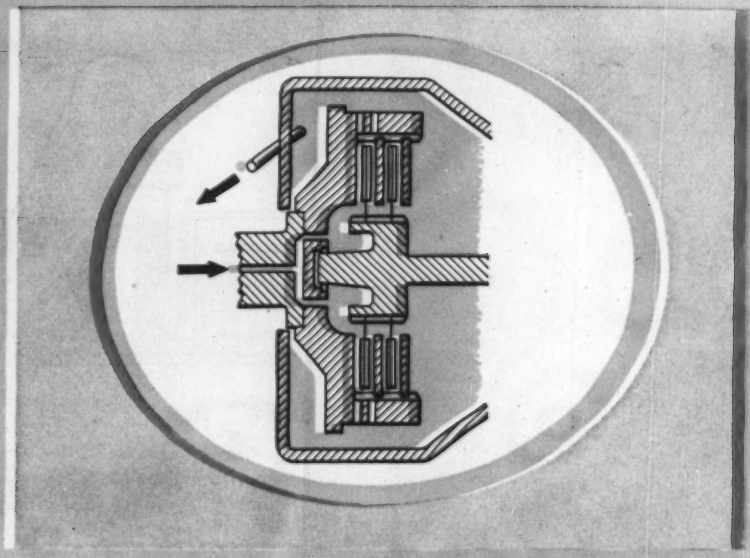


Easy-reach controls:

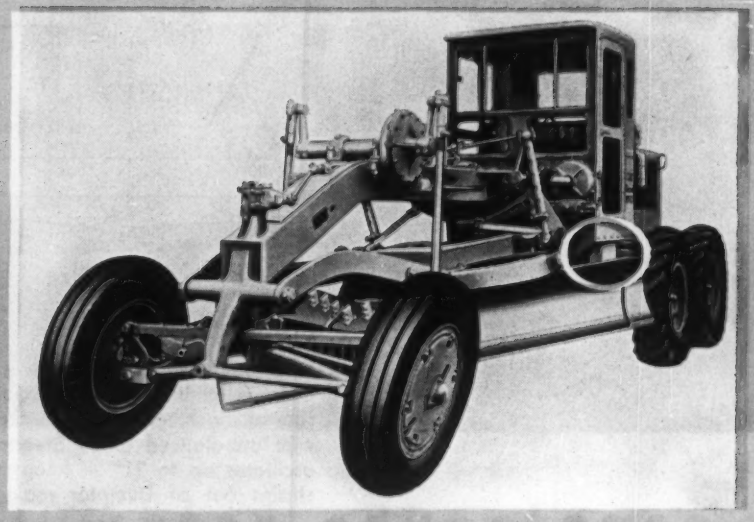
(1) Speed gear shift lever, (2) directional gear shift lever, (3) starting aid, (4) foot throttle, (5) clutch pedal, (6) brake pedal, (7) parking brake, (8) body-release lever, (9) hand throttle, (10) running lights control switch.

CATERPILLAR ANNOUNCES ANOTHER "FIRST":

NEW OIL CLUTCH for the NO. 12 MOTOR GRADER



Arrows show path of oil through housing with clutch disengaged. Facings remain cool and bathed in oil, which is carried to outlet at top by flywheel ring gear. The two steel clutch discs and clutch brake are faced with pressure-processed cork, which gives an excellent coefficiency of friction and long wear.



The new oil clutch for the No. 12 Motor Grader gives you the same reliability and improved performance as the thoroughly job-proved oil clutch in Caterpillar track-type Tractors. Rugged and reliable, it uses oil from the engine lubrication system. Here are some of the things the new oil clutch for the CAT* No. 12 can mean to *you:*

LONGER WORK LIFE—In actual on-the-job tests, clutch facings wear less than the thickness of a human hair in one thousand hours' operation! Thick clutch facings mean that work life is extended thousands of hours before discs need be replaced. And constant "oil bath" lubrication reduces wear on all moving parts.

LESS MAINTENANCE—Adjustment every 1500 hours is not unusual, after initial "break in." This is equivalent to nearly nine months without adjustment on road maintenance work! No external lubrication is needed: internal oil system lubricates pilot and throwout bearings.

GREATER EFFICIENCY—The clutch is constantly cooled, never exceeding normal engine oil temperature. This practically eliminates clutch fade, greatly reduces slippage due to overheating, and means that the clutch retains "like new" operation for thousands of hours.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Cat and Caterpillar are Registered Trademarks of Caterpillar Tractor Co., U. S. A.

99% OF ALL CAT MOTOR GRADERS ARE STILL IN USE

FIBER TUBE is sawed to size.

METAL CLOSURE nailed to form.

SLEEVE is placed on closure.

TOP CLOSURE is placed last.

Fiber Tube For Cores

Low-cost paper tubes ease making concrete conduits

A fiber tube known as Sonopipe sleeve, is light in weight, but said to be sufficiently strong to withstand the pressure of poured concrete.

The tube is designed for use in the construction of floors, roof decks, walls, and other concrete members in which cores are required for plumbing, heating, and conduit lines. It can also be used for creating drains in bridge decks and weep holes in concrete walls. The sleeve is wax impregnated and requires no greasing or sand filling.

Used with the fiber tube are two metal ends which have built in anchors. One metal end closure is nailed to the form, and the sleeve is then cut to required length with a hand or an electric saw. The sleeve is then slipped over the nailed-in-place closure, and the other end closure is inserted in the top. The anchors in the metal end nailed to the form hold the sleeve straight so that the resulting core in the concrete is true. After the concrete has set, the metal and closures are knocked out leaving holes for the pipes or conduit. The fiber sleeve is left in for sound insulating values, however it can be removed.

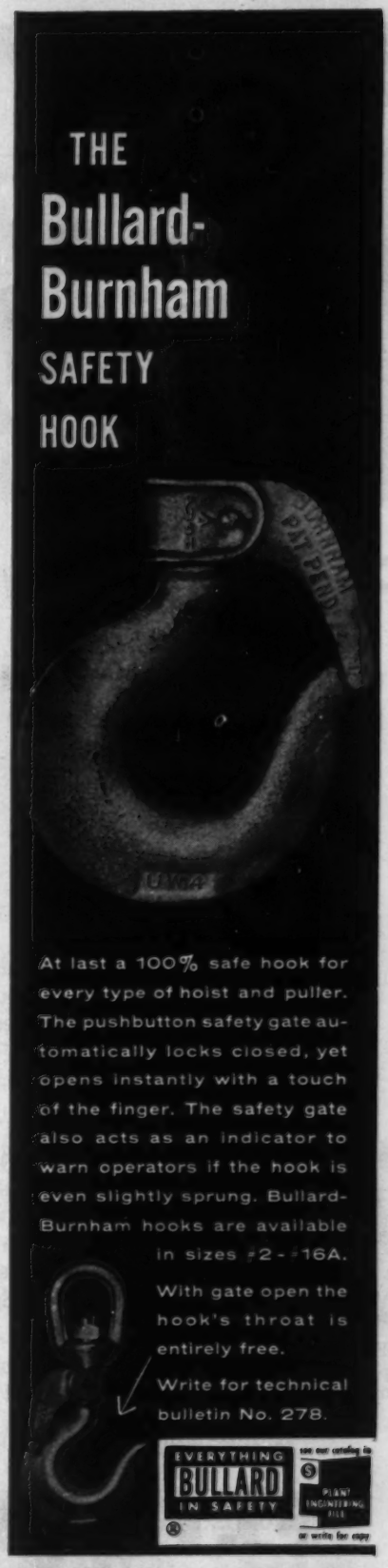
Sonopipe sleeves are available with inside diameters ranging from 2 to 8¼ in. They are shipped in 36-in. lengths in corrugated cartons. The metal end closures are also shipped in cartons. The 4-in. size is priced at approximately 18¢ per ft, f.o.b. factory. Metal ends for this size are approximately 6¢ each. SONOCO PRODUCTS CO., HARTSVILLE, S. C.

Ferrophosphorus Available For Building Atomic Shields

Development of ferrophosphorous as an aggregate for concrete used in protective shielding of atomic hot cell installations reportedly simplifies the construction of these cells. It is available in quantities adequate to meet all atomic installation requirements, according to the company.

Atomic hot cell installations are shielding chambers, about room-size, in which radioactive materials are worked or handled in machining and other types of operations. The work within such hot cells is done by remote control through systems of mechanical arms and hands which extend through sealed entrances into the hot cell and function through levers and manipulators.

Because of the necessity for close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SAFETY
HOOK
At last a 100% safe hook for every type of hoist and puller. The pushbutton safety gate automatically locks closed, yet opens instantly with a touch of the finger. The safety gate also acts as an indicator to warn operators if the hook is even slightly sprung. Bullard-Burnham hooks are available in sizes #2 - #16A.
With gate open the hook's throat is entirely free.
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E. D. BULLARD COMPANY
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Pave the way for jets!

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Provide resistance to fuels, oils, greases in critical areas. When it's time to scramble, have pavements ready!

FLINTBINDER* C-2 . . . a specially compounded hot-mix tar-rubber binder for jet fuel resistant flexible pavement. Used as surface course or overlay on asphaltic or portland cement concrete. (Meets Corps of Engr.'s specification for tar-rubber binder).

FLINTSEAL* JFR . . . jet fuel resistant hot-poured compound . . . that seals joints in concrete pavements to keep out moisture and incompressible debris. Used extensively by U. S. Air Force on concrete runways, taxiways and aprons serving jet aircraft. (Meets Fed. Spec. SS-S-00167.)

Flintbinder C-2 jet fuel resistant pavement being laid on one of many large U. S. Air Force Bases.

FLINTAR† . . . specially compounded coal tar emulsion for surface sealing asphalt pavements on service areas subjected to jet engine fuels, oils, greases and engine cleaning compounds. Squeegeed on surface, it increases pavement life. (Meets Fed. Spec. R-P-00355.)

Consider these and other Flintkote paving products for your airfield or highway projects. Write for technical data and literature.

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supervision of work within a cell, both visually and mechanically, the thickness of the protective walls which shield the radioactive materials is of importance. The thinner the wall, the easier the operation.

Nearly any dense material is considered a good absorber of radiation. and many different materials were tested. Ordinary concrete with a density of only 150 lb per cu ft proved undesirable because shielding walls would have to be six to eight feet in thickness. Low grade iron ore and other ores such as barytes have been tested but the maximum obtainable density was only between 200 and 225 lb per cu ft. (ENR May 13, 1954, p. 36).

Scrap steel, shot and steel punchings produced a dense concrete, but marked segregation occurred in such mixes, seriously affecting the workability of the mix. In some tests rusting was found which caused deterioration in the strength of the finished shield.

Ferrophosphorus, however, reportedly produces a density of 290 to 300 lb per cu ft and is said to show excellent workability and no segregation in working, pouring, or setting.

Being a chemically inert material, the resulting concrete protective shields are insoluble in acids and will not rust.

Ferrophosphorus, in the original chemical form in which it is produced, is crushed to special particle size distribution which permits it to be mixed in standard concrete mixing equipment with water and ordinary portland cement. The resulting concrete, although twice as heavy as ordinary concrete, is said to be easily worked, transportable and pourable. VICTOR CHEMICAL WORKS, 155 N. WACKER DR., CHICAGO 7, ILL.

Electric Baseboard Heater Meets All Climate Needs

A new electric baseboard heater is said to be capable of meeting the requirements of any climate, and be economical to install, operate and maintain.

Installed against the wall in place of baseboards, the units provide heat both by radiation and circulation, giving instant warmth followed by a steady thermal flow throughout the room without drafts.

After being subjected to months of testing, it is announced that the baseboard heaters can be operated with furniture placed flush to them or with draperies hung above or against them.

200 TONS AN HOUR

AT 48 FT. A MINUTE!

BLAW-KNOX BITUMINOUS PAVER FINISHERS

•

ADNUN JUNIOR BLACKTOP PAVERS

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ADNUN SENIOR BLACKTOP PAVERS

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MULTIFOOTE CONCRETE PAVERS

BLAW-KNOX

ONE Blaw-Knox PF-90 Bituminous Paver Finisher—not two machines! Steady, hour after hour production taking the entire output of the plant—not a short run for *exhibition purposes!*

That's the performance of the Blaw-Knox Bituminous Paver Finisher at Homestead Airbase at Homestead, Fla. At times the Blaw-Knox was able to secure material ahead to put down *270 tons an hour!*

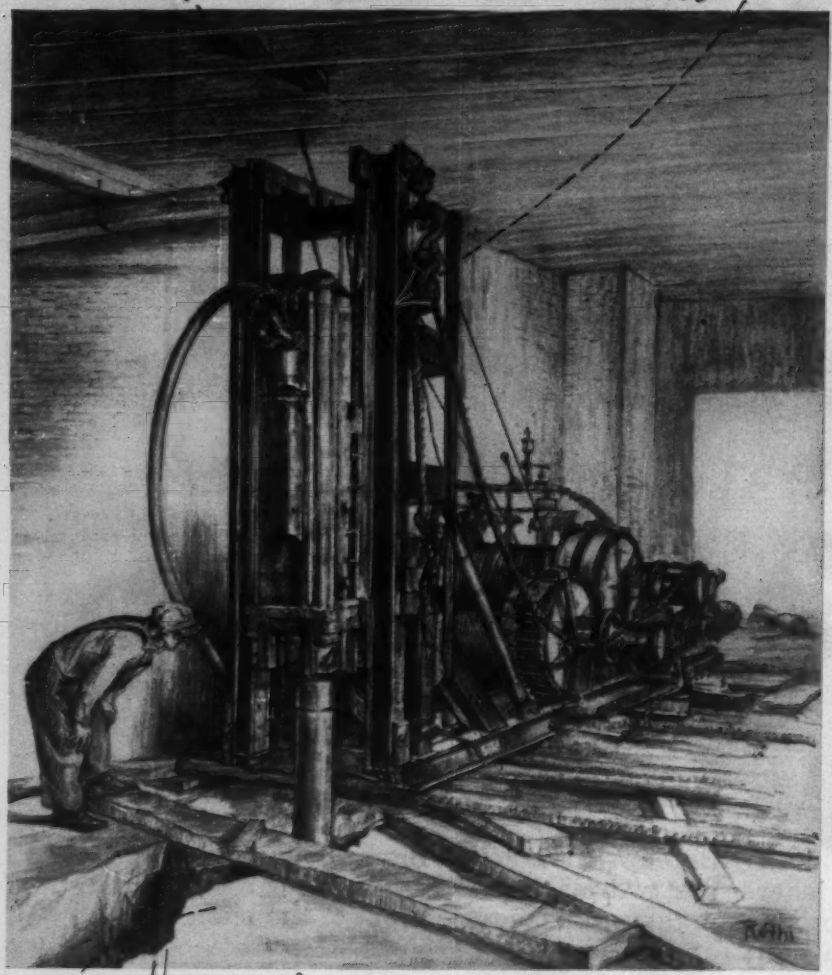
Compare this with recent records claimed for other asphalt finishing equipment. Note the smoothness of the rolled course, the firmness of the edge and the few men necessary for the job.

No other machine has ever laid asphalt at such speed AND ACHIEVED SUCH PERFECT RESULTS. Now is the time to replace slow, obsolete equipment and cut your paving costs. Ask for the new PF-90 Catalog.

BLAW-KNOX COMPANY
Construction Equipment Division
1922 State Street, Nunda, New York

ASPHALT and CONCRETE PAVERS

ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS



Project: Sealand Terminal, Stein-Davies Corp., Brooklyn, N. Y.

SPECIAL RIG DRIVES PILES INSIDE A BUILDING

Even though headroom was only 16 ft., this special rig made it no great problem to drive the necessary pipe piles to bedrock. (This rig has driven such piles, in sections, to depths as great as 90 ft.)

It is one of many types of special-purpose equipment which Spencer, White & Prentis has developed. Tilting feature permits easy moving of the all-steel machine, even when headroom is reduced to as little as 6½ ft.

CATALOGUE ON REQUEST

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NEW PRODUCTS

Maximum temperature of the vertical outer surface is approximately 100 deg.

Installed in two-foot sections, as many units are used in each room as specifications require. A control panel is coupled into the heating system of each room to allow room-by-room use and conservation of heat. They can be used in a single room or throughout the house.

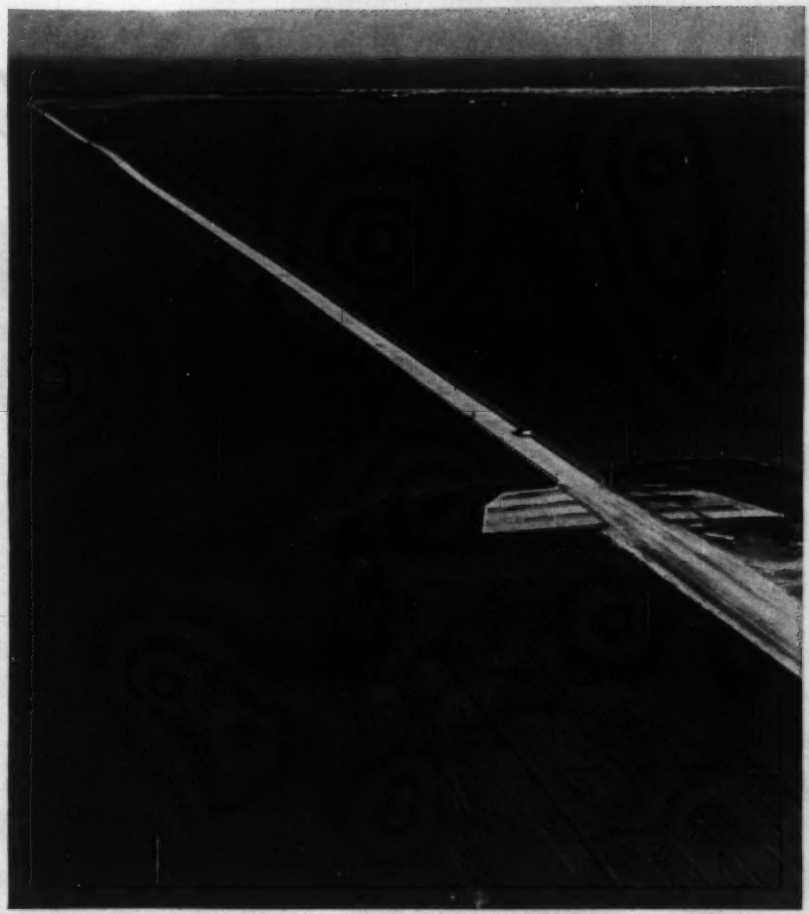
It is pointed out that wiring required for the baseboard heaters is identical with 240-v circuits normally used for conventional electric ranges.

Surfaces are of neutral brown hammertone enamel which needs no further finishing, but they can be painted any color desired. Designed primarily for surface mounting, the units can be recessed to mount against studding. WESTINGHOUSE ELECTRIC CORP., 410 BUSH ST., SAN FRANCISCO 8, CAL.

All-Angle Drill Pivots To Get Into Tight Spots

An all-angle drill has been designed to solve difficult drilling problems. The main feature of the design is that the chuck and the handle are adjustable to various angles to make it possible for the drill to assume practically any position and angle.

The ¼-in. capacity chuck swings in a 270-deg arc, and has a spring lock that enables the user to change angles with the flip of the thumb. The handle turns in a 180-deg arc at right angles to the chuck movement and is held in its several positions by an adjusting screw. Storage space is provided in the hollow handle for a large assortment of regular and high-speed drills. Price is $4.95. P & C HAND FORGED TOOL CO., P. O. Box 5926, PORTLAND 22, ORE.



Seafaring durability! K&M "Century" Pipe "goes to sea" on the Padre Island causeway pictured here. The island is located off the Texas mainland. Engineers: Parson, Brinckerhoff, Hall and Macdonald, New York. Installation contractor: W. T. Liston Co., Harlingen, Texas. Photo by Booth Studio.

In the South! "Century" Pipe is shown here at the beginning of the Padre Island causeway—a span that stretches out from the coast of Texas into the Gulf of Mexico for a mile and a quarter.

In the east! This picture illustrates an installation of "Century" Pipe at the Brookwood Estates, Stanhope, New Jersey.

Over the Sea, as across the Land

K&M "Century"® Pipe Keeps Pumping Costs Low!

Off the coast of Texas, the "Century" Pipe on the causeway pictured above prevents pumping costs from creeping up—there's never a change in the diameter of its bore! Why? This asbestos-cement pipe is non-tuberculating, highly resistant to corrosion, and immune to electrolysis.

Formed on a smooth steel mandrel, its interior surface offers a minimum of friction. The Williams and Hazen Constant "C" is conservatively placed at 140. As this pipe is relatively light in weight, handling and installation costs are low. It also meets the A.W.W.A., and A.S.T.M., and Federal specifications for asbestos-cement pressure pipe.

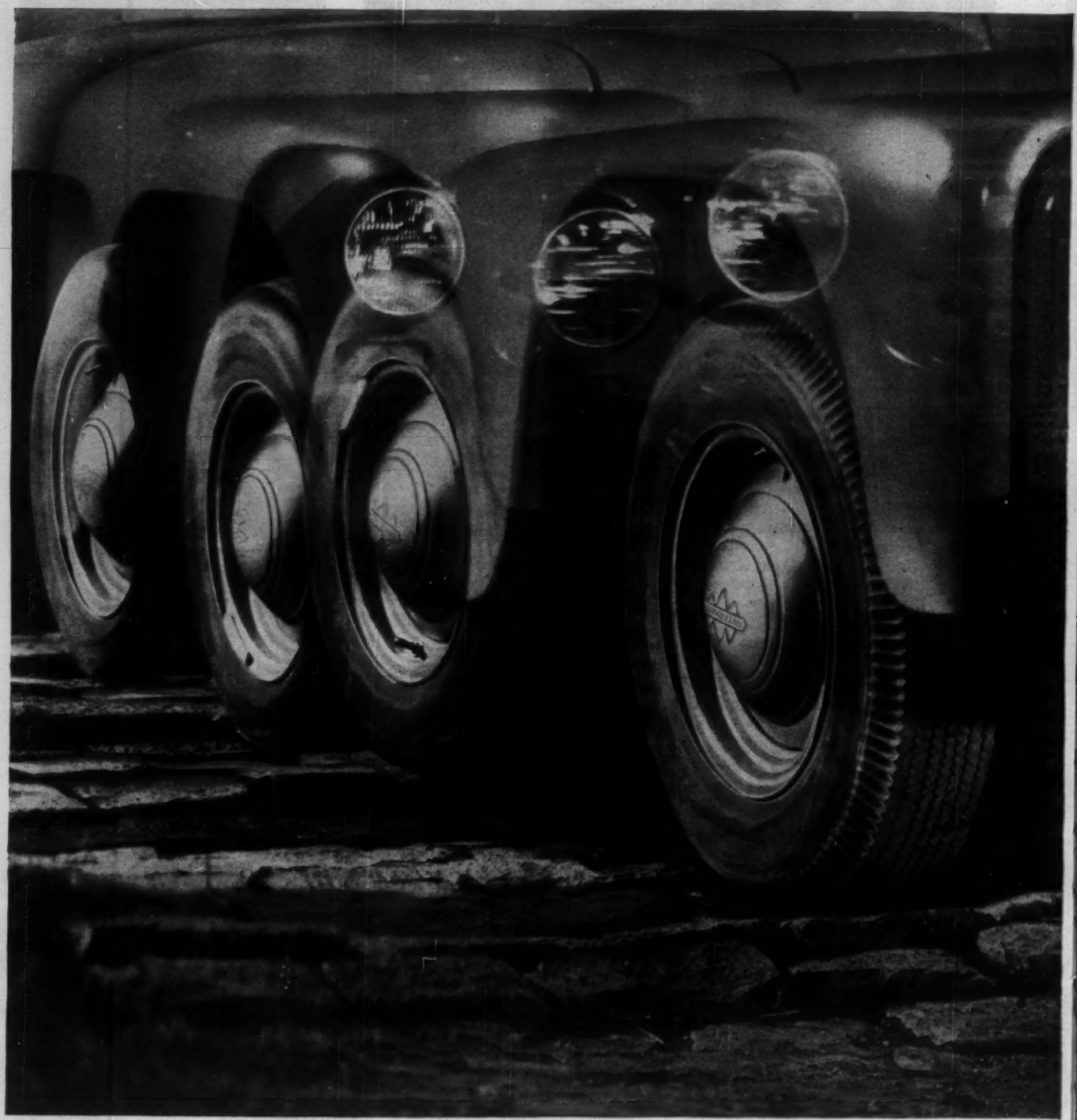
Contraction, expansion controlled. The "Century" Simplex Coupling acts as an expansion joint. Each pipe length "floats" within its own couplings. Thus, any contraction or expansion need is readily met. Furthermore, these couplings actually absorb traffic vibration.

Booklet on request! Write for your copy of "Mains Without Maintenance" . . . complete specifications and background data for K&M "Century" Pipe. There's no obligation, of course.

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

K&M best in asbestos®

1,400 crash land



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International Harvester Builds McCORMICK® Farm Equipment and FARMALL® Tractors... Motor Trucks... Industrial Power... Refrigerators and Freezers

Top TV comedy! Ronald Colman and Benita Hume in "The Halls of Ivy," CBS-TV. See your paper for date, time and channel.

ings a minute...

to save you the BIG money

Here's a beating your truck will never have to take. This INTERNATIONAL Truck is pounding over the Belgian Block course — a torture track so bumpy that, at only 12 miles per hour, the wheels slam up and down 1,400 times a minute. It is so rugged that a new driver takes over after each 20 miles of the 400-mile test.

We torture INTERNATIONAL Trucks this way to be sure that the sheet metal, cabs, springs, and all running parts will stand up *longer* under the worst kind of punishment. So that our trucks will have utmost roadability, minimum wheel fight, maximum comfort. It's all a part of INTERNATIONAL *all-truck* engineering and design to save you the BIG money — the operating and upkeep money.

INTERNATIONAL engineers are never called on to adapt passenger car engines or components to truck use. As a result, every INTERNATIONAL is built with extra margins of strength to save you the BIG money in the long run.

Proof of these savings comes from the cost records of operators who have made INTERNATIONAL the heavy-duty sales leader for 23 straight years. And the same engineering that piled up this record stands solidly behind *every* INTERNATIONAL model.

Yet with this extra value, INTERNATIONAL Trucks are often priced as low, and sometimes lower than comparable models of other makes. Before you buy any truck, let your INTERNATIONAL Dealer show you the right INTERNATIONAL for you — *all-truck built to save you the BIG money!*

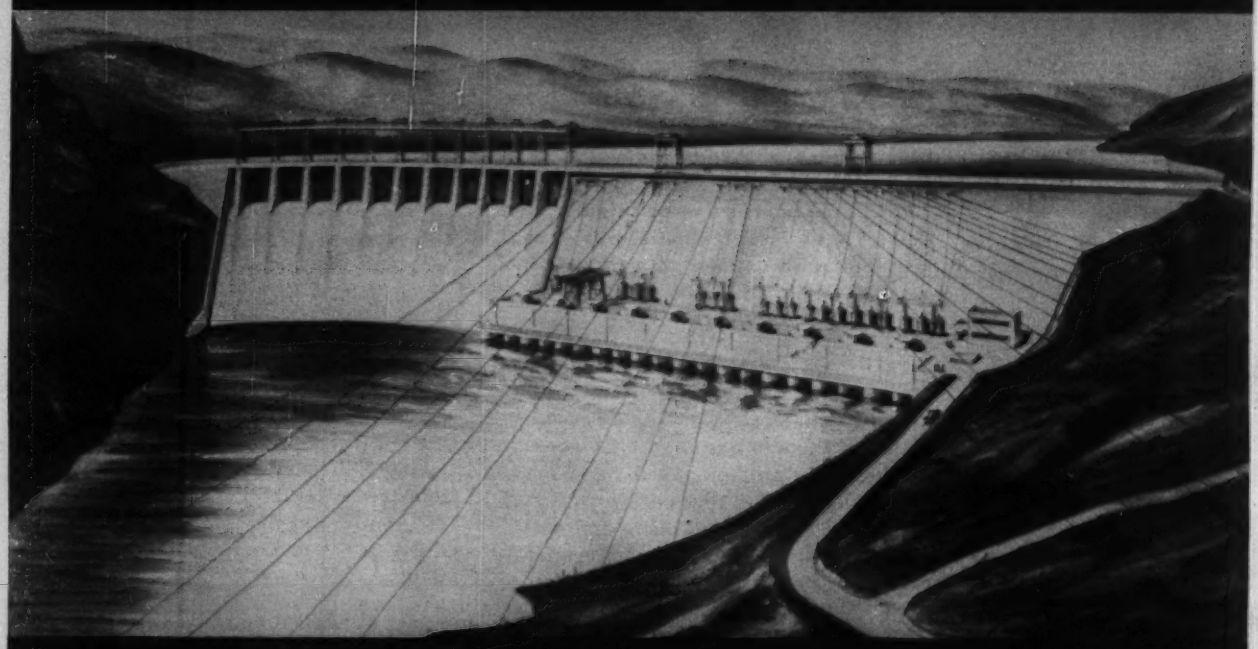
INTERNATIONAL HARVESTER COMPANY • CHICAGO

You save the BIG money in construction hauling with all-truck built INTERNATIONALS. 200 basic models from 4,200 to 90,000 lbs. GVW—conventional and COE, 4-wheel, 6-wheel, four-wheel-drive. Axle and transmission ratios for every need.

TRUCKS

All-Truck Built to save you the BIG money!

drilling for 400,000



KW of electricity...

Some 200 miles north of Sao Paulo, Brazil, Ebasco Services is engineering and constructing the Peixoto Hydro Electric Development, for Cia. Paulista de Forca e Luz. When completed, the harnessed waters of the Rio Grande will furnish 400,000 KW of electricity for the industrial development of the area.

To build the dam and accessways to it, meant moving many hundred tons of earth and rock — and for that big job Crucible Hollow Drill Rods were chosen. Experienced construction men *know* they can depend upon these rods for *optimum* performance *at lowest cost per foot of hole drilled.*

That's because Crucible Hollow Drill Rods are built to *tool steel* standards, by the leading producer of tool and special purpose steels. That means fewer broken rods or valuable bits lost on the job. So be sure that on your drilling jobs you specify Crucible Hollow Drill Rods. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Australia Enlarges Base For Strategic Bombers

Apparently as a result of recent military conferences in the Far East, Australia is at work enlarging its airbase in the tiny northwest town of Darwin to accommodate heavy bombers capable of carrying nuclear weapons.

Royal Australian Air Force leaders point out that Darwin is close enough to Indonesia, Malaya, Indo-China, Thailand and Burma to make a base at Darwin suitable for providing bomber protection. Secondly, the comment that a base at Darwin would be less vulnerable and more easily defended than the American base at Guam.

The main runway at Darwin is now being extended from 10,000 to 14,000 ft, and widened from 150 to 200 ft. Wing Commander Arthur M. Harrison, head of the RAAF's Fifth Airfield Construction Squadron is in charge of building the new runway. He says that the field will be ready for heavy planes within two years.

Cosmic Recorder Estimates Snowy Mountain Overburden

The use of cosmic recorder on the construction of the giant Snowy Mountains Hydro Electric Scheme in Australia has proved economical and much faster than drilling.

A Geiger counter telescope, developed by Dr. E. P. George of the School of Physics, University of Sydney, Australia, was used to measure the mass of overburden of the Guthega-Munyang tunnel of the scheme. Cosmic radiation was used as an indicator and the mass determination was achieved by comparing the intensity of the rays in the open at the tunnel entrance and at a selected point within the tunnel.

Scientists were called to assist in the measurement of the thickness of rock over the tunnel in question. The Hydro-Electric Authority wanted to know the mass per unit area in order to be able to calculate the magnitude of the upward gravitational pull of the overburden on the water in the tunnel. The results proved satisfactory and it is thought that for depths greater than 50 ft the cosmic ray recorder will give the answer faster and cheaper than drilling.

However, a pre-existing hole or tunnel is necessary and the radiation recorder must be placed below the overburden to be measured. The result is only the mean value of the mass per unit area and the method does not provide details of the variation of density with depth. But when only the weight of material per unit area over a pre-existing hole or tunnel is needed, the cosmic absorption measurement is very satisfactory.

Alberta Resists Attempts To Force Pollution Control

Persistent attempts by the sister provinces of Saskatchewan and Manitoba to persuade Alberta to join an interprovincial water pollution board with wide powers have met with a firm rebuff in Edmonton, in and around which a booming petrochemical industry has been developing.

Saskatchewan has objected in particular to pollution in the North Saskatchewan River. Water as far as 400 miles downstream from Edmonton had become so unpalatable at times that it was not usable for drinking purposes in the city of Prince Albert despite filtration processes, Saskatchewan officials claim.

Alberta officials promised the other provinces in recent conferences that they would take all necessary measures to control pollution in the future, but said flatly that they would not permit any other government to instigate action through a pollution control board which might jeopardize the expansion of industrial plants.

Key Budapest Rail Link Restored by New Bridge

Budapest's newest and longest Danube bridge—the eighth built since the war—was opened recently, according to the Hungarian News and Information Service.

The structure is a railway-pedestrian bridge at Ujpest, replacing one demolished by retreating German troops in 1945. For the past ten years, all rail traffic from the north has had to make a detour around Budapest to cross the Danube via a bridge in the southern part of the city.

Of steel girder construction, the structure is said to be more than 3,000 ft long, carrying a double bicycle track and a pedestrian walk in addition to the double track railway line. Builders had to search every inch of the river bed for some distance on either side of the site for unexploded mines and bombs.

Soviet Engineers Blamed

Part of the blame for increased floods in Central China has been put on "misdirected engineering plans" given to Red China by Soviet engineers. How true this is may be disputed, but it is reported that the number and severity of floods has increased with the number of river engineering jobs done in recent years in this area.

Latest floods are said to have reached such a proportion that flood news is critically censored.

Austrian Government Puts Brakes on Building Boom

The "Hochkonjunktur" or boom in Austria's public and private construction business was braked by a decision of the government to slash construction credits and budget fund releases by 20% starting mid-July 1955. Through this measure it is hoped that bottlenecked conditions in the supply of labor and materials will be avoided.

Austria's annual construction capacity—based on the number of construction workers and the maximum supply of materials—is estimated to range between $461.5 million and $480.7 million. Expert opinion indicates, however, that shortages—particularly in cement and steel—occur when a level of $442.3 million is reached.

Just how effective the proposed reduction will be remains to be seen. An immediate reduction in the federal budget will be made—from $107.7 million to $86.2 million—but it cannot be immediately predicted if the seven provincial or state governments will make reductions in their construction budgets which total $84.6 million.

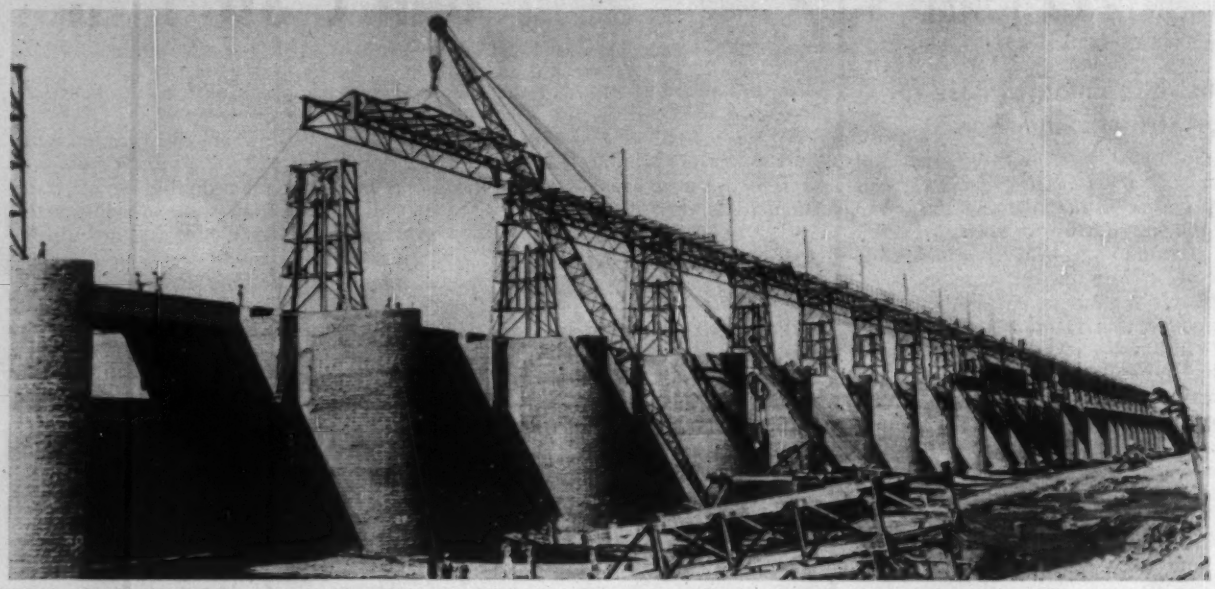
10-Year Italian Road Plan To Include Private Capital

The Italian government has announced a 10-year program for construction of more than 2,100 mi of superhighways. Private Italian and foreign capital will participate.

Among the major projects will be an expressway running from Milan to Bologna, thence via Florence, Rome and Naples to Reggio Calabria; another between Naples and Bari; and, in Sicily, a Palermo to Catania highway.

Government participation in the program will amount to about $160 million. Private capital will be assured a return on its investment by an arrangement whereby tolls can be charged for 30 years on sections built with non-government funds.

(*International continued on page 84*)



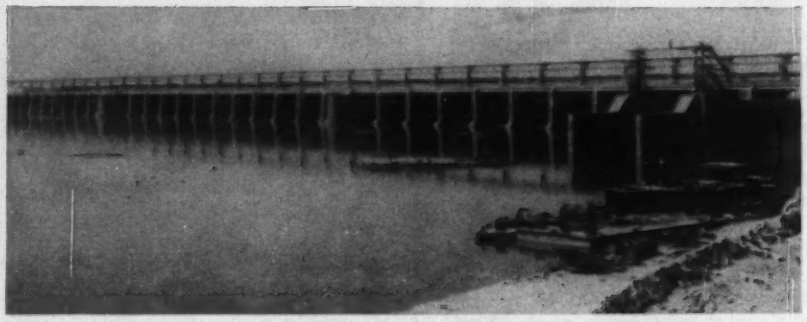
STEEL OVERBRIDGE on headworks of Ghulan Mohamed Barrage provides for the operation of the gates which are 21 ft deep.

Indus Harnessed by Ghulam Mohamed Barrage

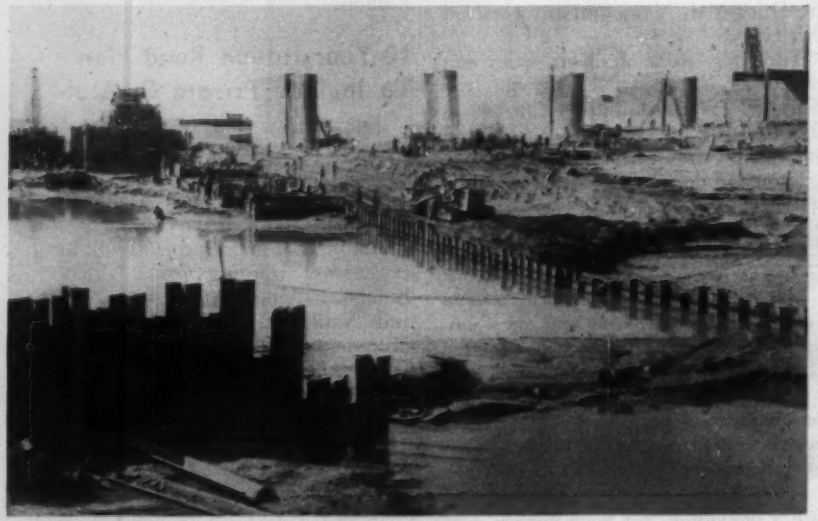
Of all the river projects in Pakistan, the undertaking on the Indus—4½ mi upstream from Kotri in Lower Sind Province—is by far the most extensive and most important.

Now completed after four years of construction, the barrage consists of 44 spans 60 ft long and measures 3,000 ft in length. It is designed to pass a maximum flow of 13,895,000,000 gpm.

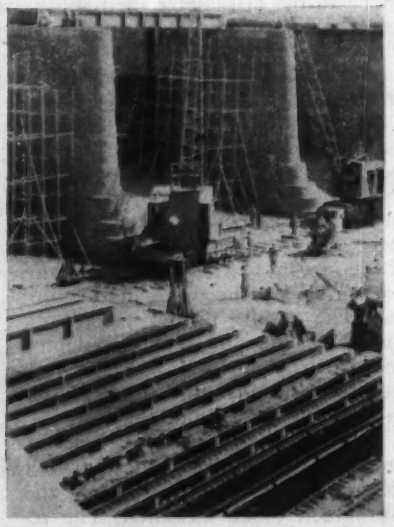
Two divide walls enclose the pockets containing the head regulators of the canals. These walls perform a silting function permitting the canals



SHIP LOCK at right permits river passage beyond dam. The vehicle bridge atop dam may be raised. The 3,000-ft barrage consists of 44 spans each being 60 ft long.



UNDER-SLUICES from upstream side were under construction in early August 1953. Progress was made difficult by dust and by 120-deg temperatures.



DIVIDE WALLS contain head regulators of canals and perform desilting operation.

Springs and sugar sand can't stop them!

3 Tournapulls deliver 55 to 69 loads hourly over hilly 1500′ cycles

Building this bridge approach near Hart, Michigan, presented Contractor Lavern Rice with some extremely tough loading conditions.

Most of the 102,000 yards involved was abrasive sugar sand. The rest was sticky blue and red clay. Virtually every cut uncovered a flowing underground spring. "It made for the roughest job I'd seen in 25 years," said Operator Ernest Harris.

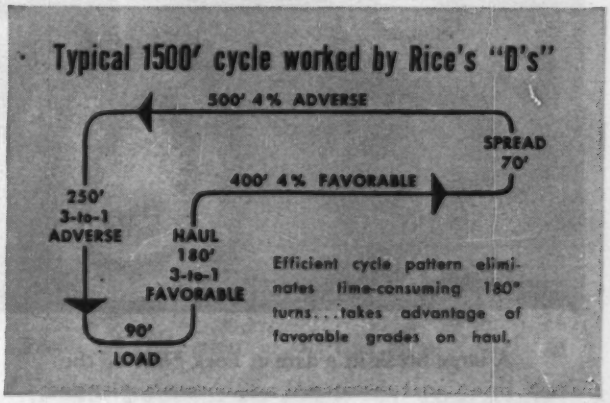
To handle all earthmoving, 3 D Tournapulls and 1 rubber-tired Tournatractor were driven from the company office in Hartford, Mich. In 6 hours, the Tournapulls had traveled the 120 miles and were moving dirt.

About 95% of the time, the "D's" were push-loaded by the 186 hp Tournatractor or a 102 hp crawler. In sand, loads of 6.3 pay yards took an average of only 25 seconds. In clay, load time for 5 pay yards averaged 20 seconds. Time studies on one 1500′ cycle show each "D" delivered 23 loads per 50-minute hour. Over the whole job, Mr. Rice states each "D" averaged between 18 and 19 loads per hour on the same length haul.

This push-loading production was nearly matched on the other 5% of the job, where the 9-ton Tournapulls were loaded by clamshell with very wet material. "I really like this LeTourneau-Westinghouse equipment," says Mr. Rice. "We couldn't have accomplished the majority of this project without it."

Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. TDP-587-H-bw

Tournatractor's and Tournapull's ability to work under any kind of conditions can pay off for you, too. Ask us for owner-verified performance reports on work like yours. Then ask for a demonstration of Tournatractor or Tournapull on your job. There's no obligation.


Typical 1500′ cycle worked by Rice's "D's"
500′ 4% ADVERSE
SPREAD 70′
400′ 4% FAVORABLE
250′ 3-to-1 ADVERSE
HAUL 180′ 3-to-1 FAVORABLE
90′ LOAD
Efficient cycle pattern eliminates time-consuming 180° turns...takes advantage of favorable grades on haul.

With Tournatractor pushing, "D" picks up load in 90 feet. Cuts average 27′ in depth and usually include horizontal layers of various types of sand as well as blue and red clay.

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

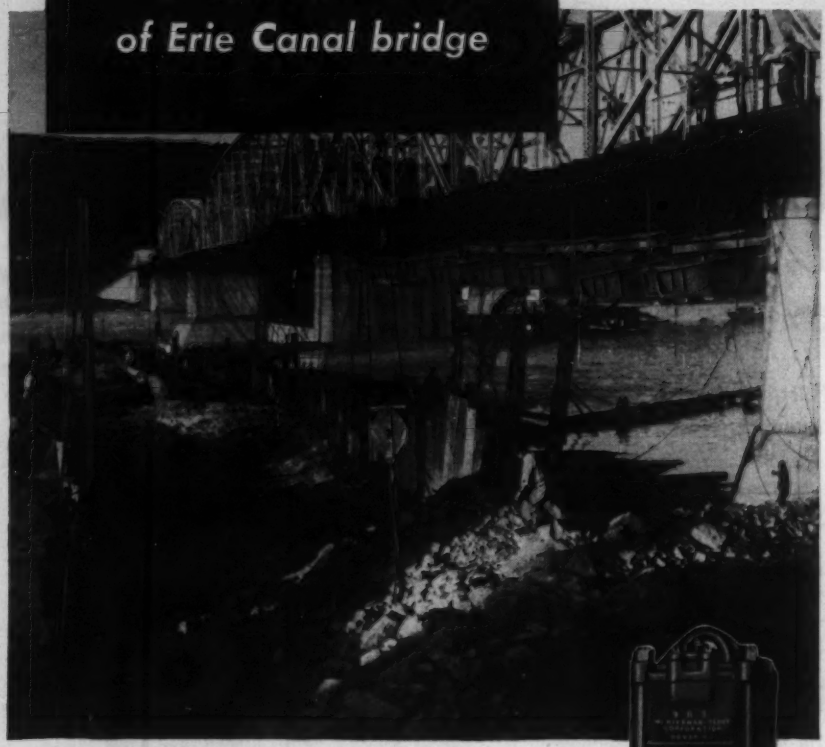
A Subsidiary of Westinghouse Air Brake Company

Emergency!

McKIERNAN-TERRY PILE HAMMERS

help quick protection of Erie Canal bridge

Part of steel sheet cofferdam, built by the Canal Maintenance Bureau of N. Y. State Public Works Dept., extending from endangered bridge pier to the river bank above the abutment, and filled with heavy gravel and quarry stone.



A large break in a dam at Lock Nine on the Erie Canal threatened an abutment, pier and superstructure of a nearby bridge because of the huge boulders and chunks of concrete carried by the current through the break.

Four McKiernan-Terry Double-Acting Pile Hammers, sizes 5, 7 and 9B3, were used to quickly drive steel sheet piling for a cofferdam constructed to make the emergency repair. Here, as in uncounted other instances, McKiernan-Terry Hammers helped to do an urgently needed job speedily and securely.

Write for bulletins describing the complete McKiernan-Terry line of double-acting hammers and extractors and single-acting hammers for every piling job.

MK 348

McKIERNAN-TERRY CORPORATION

MANUFACTURING ENGINEERS • 80 RICHARDS AVE., DOVER, NEW JERSEY

to draw water free from the heavier silts that deposits in the pockets. Pocket gates may be opened to move excess silt downstream.

A steel overbridge carried on steel trestles provides for the operation of the gates which are 21 ft deep and hold water 20 ft above the crest of the barrage. The maximum head will be 31 ft in cold weather.

The barrage carries a vehicle bridge 20 ft wide with 4-ft pedestrian crossings on each side. The bridge is carried on prestressed, precast beams, the first time this method has been used in Pakistan.

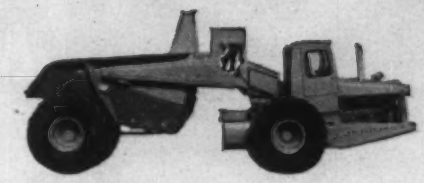
One of the most difficult problems connected with the project was the diversion of the river. The Public Works Department of the Sind Government was faced with the problem of moving over 1½ million cu ft of earth to divert the course of the Indus. Rediverting the river over the completed work was again a major problem with most of the work proceeding during the winter when the river discharge was at its lowest. However during January, February and March of 1954, the river was abnormally high and floods due to heavy rain and snow in the North delayed the diversion operations. It was decided to pass the river in part over the barrage and partially over the old river channel. During September, 1954, the diversion was completed during a total river discharge of 11,111,600,000 gpm.

The four irrigation canals fed from the barrage have a capacity discharge of 651,080,000 gpm that will enable 2,800,000 acres to be cultivated of which over 1,700,000 is virgin soil.

The left bank canals have a total of approximately 185 mi. On the left bank the barrage feeds the existing Fuleli canal that will be straightened and modernized, and alongside the Fuleli a new canal known as the Pinyari Feeder is being completed. Longest of the feeders is a 70-mi lined channel.

The Kalri Baghar feeder canal on the right bank is 42 mi long. More than eight miles of this canal passes through rock that requires blasting from 25 to 50 ft. Completion is expected in April, 1956.

Karachi, the capital of Pakistan, will receive a valuable reserve water supply from the Kalri Canal. After passing through the hills this canal will flood a series of valleys to form a lake 20 mi long and 45 mi wide. This lake also affords the possibility of a power development from a drop of 20 ft at the lower end of the lake.

YOU can earn more with this rear-dump  hauler . . .

Hauls anywhere — With big rubber tires Tournapull Rear-Dump safely travels mountain trails, cross country, city streets . . . hauls over roughest terrain, through mud, snow, soft fills.

Reduces maintenance — Because Tournapull has no hydraulics, no jack lines, no long driveshaft, no frame, springs or tie rods, it eliminates common troubles of other rear-dumps.

Dumps fast, clean — A touch of a switch activates hoist motor. Body lifts quickly, swings behind rear wheels to dump clean over bank. Streamlined bowl sheds material readily.

Cuts weather delays — Power-proportioning differential automatically applies extra power to drive wheel on firmest footing . . . pulls unit through soft spots which stop ordinary haulers.

Works fast in tight quarters — 90° turns within a radius of half of unit's length, plus power steer, quickly position "big-target" body under dipper. No switching back and forth, no turntables.

Eliminates manual work — Fingertip electric controls on instrument panel activate electric motors at point of action. Heavy manual work fighting steering wheel and control levers is eliminated.

Resists body shock, damage — Three-layer, all-steel, grid-type bowl with tool-steel floor resists shocks of dumped-in rock. Big, wide bowl opening proves easy target for any loading unit.

Improves safety — Multi-disc air brakes have more braking surface on one wheel than most haulers have on 4. Low center of gravity, good visibility, front-wheel drive, easy control also boost safety.

Delivers full power—Torque converter (optional) automatically balances load and torque so you get full hp always. Lugging is reduced; shocks between engine and final drive virtually eliminated.

Reduces fatigue — Big low-pressure tires and air-foam cushion seat smooth out bumps . . . eliminate "up-and-down ride". Push-buttons control every action. Fatigue factors are greatly reduced.

Insures future earnings—Behind Tournapull prime-mover, you can interchange scraper, bottom-dump, other trailing units. With them, you fit any type of future operation, earn more annually.

Each of the above points is proved in this booklet . . . Ask for your copy!

Tournapull—Trademark Reg. U.S. Pat. Off. R-575-G-bw

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Compacting sub-base on the Ohio Turnpike.

DO IT FASTER — BETTER and CHEAPER with the JACKSON VIBRATORY COMPACTOR!

MACADAM CONSTRUCTION: All around the country on major paving projects the JACKSON VIBRATORY COMPACTOR is being hailed as the most advantageous equipment ever developed for achieving specified density in rock, slag, soil-bound macadam, gravel and sand base courses. Uniform compaction to final density is obtained in rock macadam courses up to 12" in minimum time. The dry fines are quickly vibrated into all voids, filling them chockfull, solidly, from top to bottom of the course. Standard width is 13',3". Working speeds up to 60 FPM, reverse travel: 5½ MPH.

SUB-BASES, GRANULAR SOIL-CEMENT PAVING and SAND FILLS: It is equally efficient on gravel sub-bases and granular soil-cement paving or base course construction. And it's a bear-cat for compacting sand fills such as bridge approaches, since it quickly achieves desired density and individual units may be subtracted and even fitted with operating handles to suit every condition and to get into the really tight places.

PAVEMENT WIDENING: In any granular material used in flexible base course widening specified density is accomplished in one pass with the compacting units towed in tandem at the side of the tractor. Interchangeable bases from 12" to 26" wide may be substituted for standard 26" bases to suit requirements.

By all means investigate this time and money saving equipment

FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

INTERNATIONAL

Tunnels Solve Problem of Overhead Line Obstruction

At Portishead Dock in Sommerset, England, where a second power station known as B station is under construction, two steel-lined tunnels, 345 ft long, 8 ft in dia and with 80-ft vertical shafts at each end, have been driven beneath a lock to house a number of 132kv transformer and generator cables.

The cable tunnels are the answer to a problem which arose when the decision to build Portishead B station was first taken by the South Western Division of the Central Electricity Authority. The difficulty was that behind the site selected for the new building stood the transformers of the existing A station which were formerly connected by overhead lines with switchgear on the opposite side of the lock. The new station would stand directly in the way of these lines, however, so that an alternative connection had to be found. It was decided that two 345-ft tunnels should be driven beneath the lock to house connecting cables.

Three 3-core 132kv transformer cables have been installed to make the new connection which are now in service. From the transformers situated behind the rising structure of B station, they fall 75-ft along a sloping concrete chase skirting the new building and continue beneath a cable basement in front of it. At this point they are laid down an 80-ft vertical shaft, along the 345-ft tunnel and then up a second 80-ft shaft being brought out through an access house on the other side of the lock.

The tunnels are also to be used to house 132kv generator cables which will ultimately connect the new B station with its switchgear across the lock. In fact, although a considerable amount of work remains to be done before the station begins generating, one of these cables has already been laid and a further two circuits are now being installed. Ultimately, another three cables will be laid to connect generators 4, 5 and 6.

The installation of the cables in the tunnels presented special problems because of the 80-ft vertical shafts at either end. A specially designed system of steel supports was supplied by British Insulated Callender's Construction Company Limited, London, who also installed the cables. These were laid in the tunnels without any joints having to be made.

The 3-core 132kv cables used for this installation are of the impregnated pressure type.

Dirtmoving for Disneyland

After 20 years of dreaming and planning, Walt Disney's fabulous Disneyland is at long last a reality. Located just off the Santa Ana Freeway about 30 minutes from Los Angeles, this giant playground is expected to attract 5 million visitors yearly. Main attraction will be a castle filled with life-size Disney cartoon characters (Fantasyland). There'll also be a log fort and authentic buildings of the Old West (Frontierland). There'll be boat voyages past lifelike displays of romantic parts of the world (Adventureland) and "rocket trips" to a city of the future (Tomorrowland).

To the realization of this whole magical $10,000,000 Disney kingdom, Contractor S. A. Cummings, Compton, California, played an important part. Cummings' 5 C Tournapulls handled nearly all dirt work on the 160-acre tract . . . moving 280,000 cubic yards of sand and sandy loam in 6 months. Almost all of the yardage moved was precision work. The "C's" dug boat channels, hauled material for railroad embankments, built artificial hills and even rocket platforms. They graded a parking area for 10,000 cars, leveled building sites, dug several lakes, a castle moat, and a storm drain.

5 Tournapulls move 300 yds. hourly

In typical operation — excavating a 5-acre lake and spreading the material to build up 20′ berms for a ⅝-scale model railroad — each of the 5 Tournapulls was push-loaded with 12 pay yards of sand per load. Typical 6,600′ cycles, with most of haul up 5 to 10% grades, took 10 minutes. Output per machine per 50-minute hour averaged 60 pay yards . . . output for the fleet of 5 "C's" averaged 300 pay yards per hour.

Ralph Gastelum, Supt. for Cummings, reports, "I believe this job was ideal for Tournapulls because of the sand we had to work with, and the small places we had to maneuver in. Fills were high and narrow, and cuts, particularly the channel cuts, small and winding, which made it very difficult to load . . . yet Tournapulls did an excellent job."

Let us show you how Tournapulls can help speed your jobs, too. Call or write for details on performance . . . price . . . and delivery!

Tournapull—Trademark Reg. U.S. Pat. Off. P-838-8-b

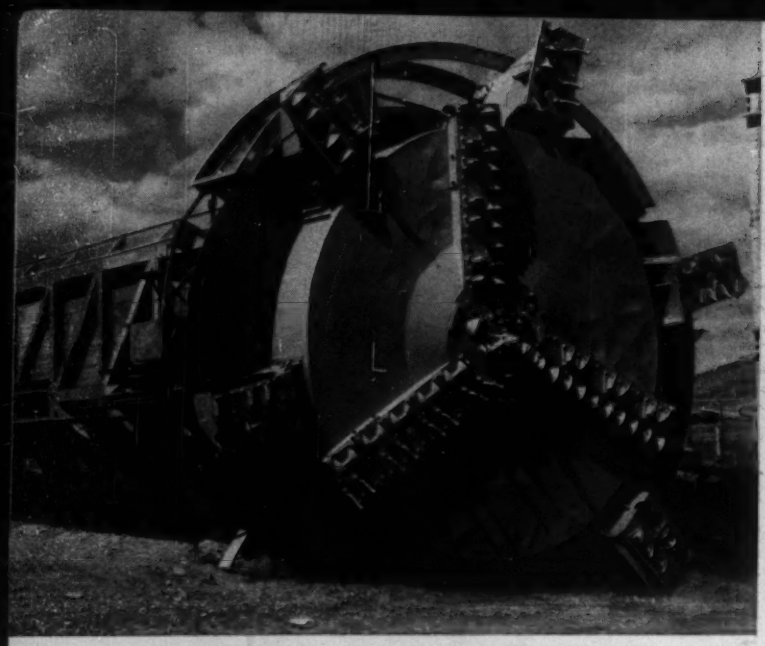
NOW . . . a size Tournapull TO FIT YOUR NEEDS

Model B . . . 23 yds. heaped Model C . . . 16 yds. heaped Model D . . . 7 yds. heaped

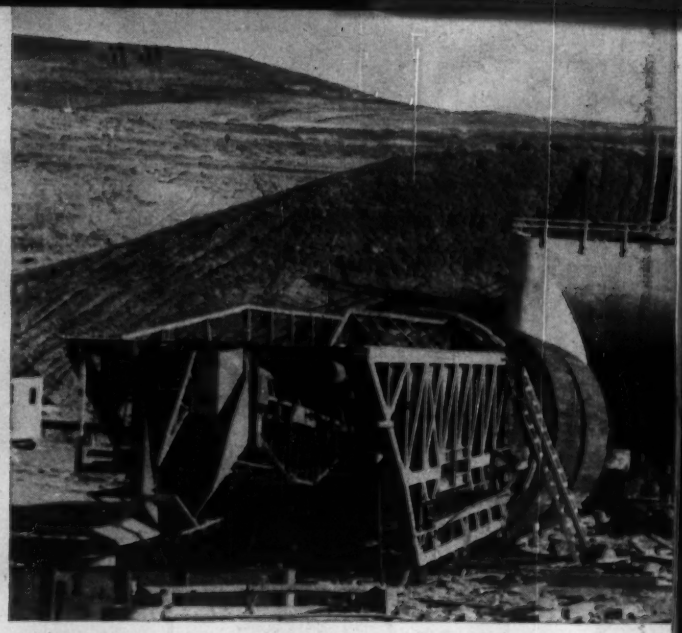
LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



MECHANICAL MARVEL shows its mighty teeth. The 26-foot cutting face can be raised, lowered, and swung from side to side to alter direction of cut. Note concentric cutter heads and shale scoops.

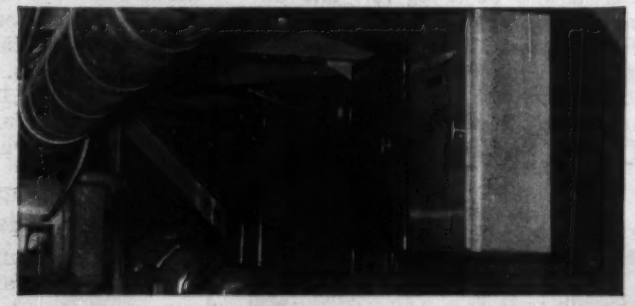


IMMENSITY OF JOB is suggested by view of six tunnel entrances bored in record time by new mole (above). Reinforced concrete tunnels average 1830 feet long.

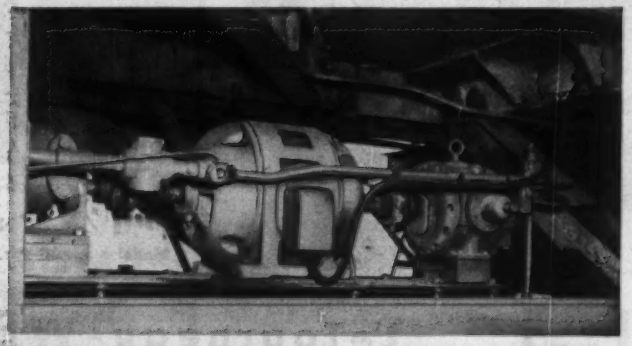
DIGGER'S RELIABILITY depends largely on performance of two 200-hp G-E wound-rotor motors driving cutters through gear mechanisms. Conveyor carries rubble to cars at rear of mole.

THREE COMPACT 167-kva G-E transformers in digger step down power supplied by cable from diesel-generator outside.

PROTECTION of electrical system is provided by dead-front panel with circuit breaker and ground relay. Compact General Electric equipment had to fit into tight space available.



G-E MOTOR CONTROLLERS provide short circuit protection and permit centralized push-button control at operator's station.



EXACT FORWARD MOVEMENT into rock face is accomplished with highly dependable G-E 25-hp motor furnishing power for hydraulically operated "feet" which propel mole on tracks.

GENERAL ELECTRIC

Electrically powered by General Electric . . .

New giant "mole" chews tunnels 26′ wide over 4 times faster than previous methods

Mittry Constructors' tunnel digger illustrates high productivity possible with electrified tools

At the Oahe Dam of the Missouri River development near Pierre, S. D., an electrified tunnel digger 90 feet long has slashed tunneling time, costs and dangers. This imaginative use of electricity is even more successful than anticipated by its pioneering designers. James S. Robbins and Associates, Chicago, designed and built the "mole" for Mittry Constructors of Los Angeles under license from Goodman Mfg. Co., Chicago. According to Robbins, help from J. R. Porter, G-E engineer, greatly contributed to completing the digger two months ahead of schedule.

Problem was extremely difficult: How to dig six tunnels each over one-third mile long without exposing shale more than 30 days? Longer exposure would dry and dangerously weaken shale.

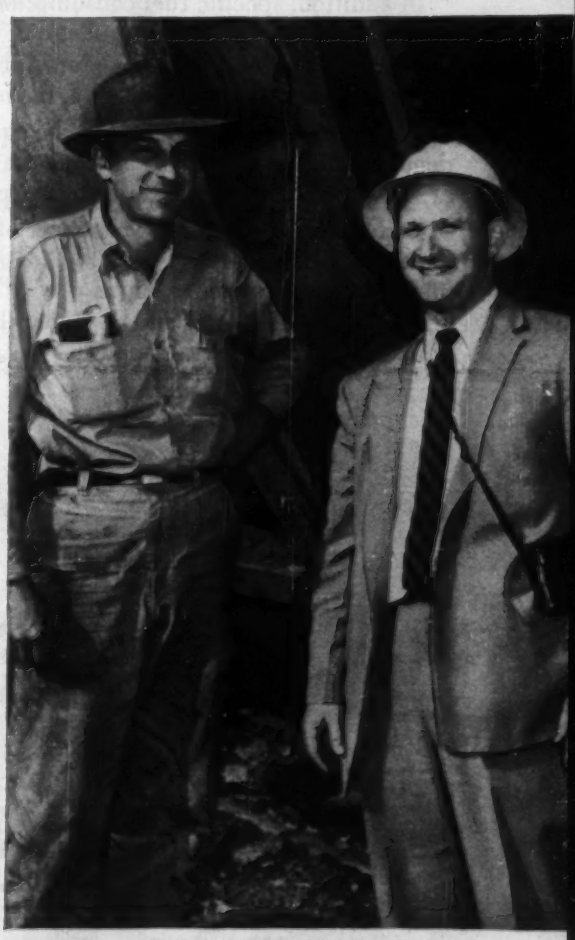
Solution was new electrified tool, which dramatically cut tunneling time to less than one fourth that needed by other methods. Digger was designed with two motor-driven concentric revolving cutter heads with large shale scoops on outside ring. Sections revolve in opposite directions to equalize cutting torque. Scoops dump shale through hopper to conveyor belt. Every four feet, a large I-beam is rammed into shale walls for support. Concrete is then pumped into forms to finish walls.

Down time has been practically zero. Despite conditions such as a constant humidity of 95% in the tunnels, G-E equipment has reliably powered this giant mole continuously and efficiently.

Electrified construction tools can pay off the same way for you too. Let your G-E Apparatus Sales representative show you how G-E equipment, backed by G-E engineering service, can raise tool productivity. Contact your nearest G-E Apparatus Sales office, or write General Electric, Sect. 664-37, Schenectady 5, N.Y.

Engineered Electrical Systems for Heavy Construction Tools

GENERAL ELECTRIC



STANDING BY MOLE'S "FACE" are Bill Mittry of Mittry Constructors and Jim Dillman of G.E., who helped plan the new tunnel giant.

MORE PULL WITH LESS FUEL!

AiResearch Turbochargers provide rapid response to acceleration demands... end objectionable smoking!

Consider what the application of AiResearch Turbochargers to diesel locomotives will accomplish: A team of these small power packages will provide a greater increase in power at smaller cost in space and weight than any comparable turbocharger or supercharger installation.

In addition, specific fuel consumption on a horsepower per hour basis will be far less. Sea level performance will be restored within operating limits at altitude, response to acceleration demands will be rapid and excessive smoking under operating power eliminated. Also, the noise level will be greatly reduced.

Application in other fields will be equally effective, as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability.
Your inquiries are invited.

THE GARRETT CORPORATION

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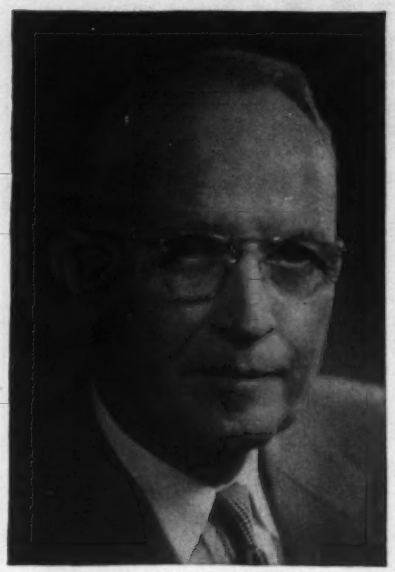


W. A. Abram

Named New Chief Engineer Of Texas Construction Firm

The Tellepsen Construction Company of Houston, Texas, has appointed William A. Abram as chief engineer of heavy engineering and highway projects. This is a newly-created post in the company's Engineering Division.

Since joining the firm in 1948, Abram has been directing heavy construction work. He is a civil engineering graduate of Iowa State College and for eight years operated his own construction company, specializing in highway projects in the midwest.

As chief engineer, Abram will be responsible for all of Tellepsen's heavy construction operations.

Sanitary Engineer Named To Water Board in Texas

Gov. Allan Shivers has appointed R. M. Dixon of Dallas to the Texas State Board of Water Engineers, succeeding Andrew P. Rollins, who resigned several months ago.

Dixon is executive director of the Texas Municipal Contractors' Association and was one of three men recommended for the post by the Texas Society of Professional Engineers. Under the appointment, Dixon will become chairman of the board on Aug. 19.

He is a Texas A&M graduate in sanitary engineering and has been active for several years in the study of Texas water problems.

Dixon served with the U. S. Department of Agriculture before the war, developing recreational reservoirs in the West Texas Panhandle, and later worked with the corps of Engineers on water supplies for military installations in the southwest. After the war, he joined the faculty of Texas A&M.

The present board chairman, H. A. Beckwith, will remain on the board as a member.

Structural Engineer Joins Timber Engineering Company

William A. Weidemeyer, structural engineer, has joined the engineering and research staff of Timber Engineering Company, research affiliate of the National Lumber Manufacturers Association.

A civil engineering graduate of George Washington University, Weidemeyer was formerly associated with Humphreys & Harding, construction engineers in Washington, D. C.

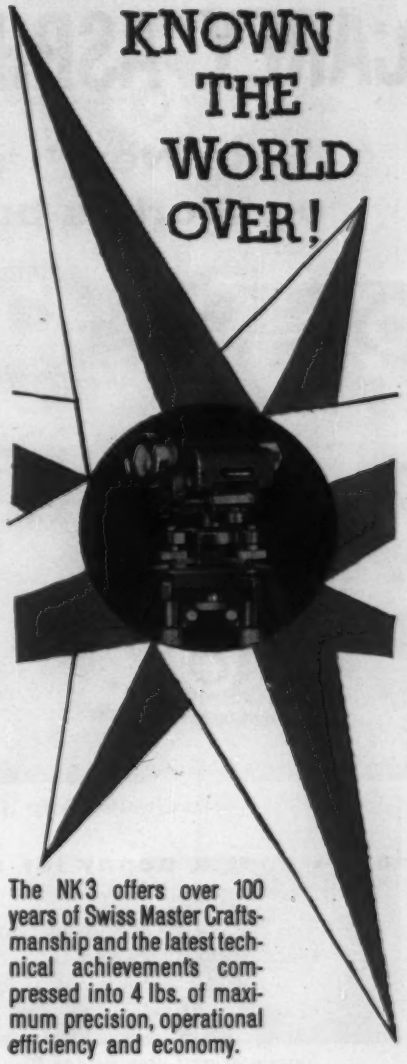
In his new post, he will be engaged initially in developing typical designs of timber structures for use by architects, engineers, and others who design wood structures.

B. A. Sawyers Is Appointed State Road Commissioner

Gov. William Marland has named Burl A. Sawyers of Charleston as State Road Commissioner of West Virginia. He succeeds H. K. Griffith, who resigned in June.

A native of West Virginia, Sawyers attended Concord College and is a

B. A. Sawyers



The NK3 offers over 100 years of Swiss Master Craftsmanship and the latest technical achievements compressed into 4 lbs. of maximum precision, operational efficiency and economy.

- Mean leveling accuracy per mile (normal conditions ± .008 Ft.)
- Coincidence bubble is viewed directly through 30X telescope, allowing constant check on bubble centering while reading rod.
- Ready for use right out of the case. Highest precision leveling with coincidence spirit level and tilting screw. Coated optics give increased brilliance and contrast in the image.

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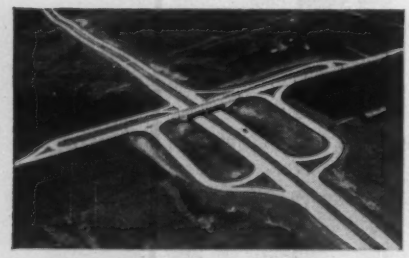
"Like New" after 14 years on World's busiest bridge

Famous Triborough Bridge 14 years after Carey Asphalt Plank was installed

Hasn't cost a penny for maintenance or repairs!

The Harlem River Span of famous Triborough Bridge (N.Y.) is a rugged proving ground for surfacing material! Daily, many thousands of trucks, buses and passenger cars give it a relentless pummeling. But look at the smooth, durable surfacing *14 years after* Carey Asphalt Bridge Plank was installed! Here's proof that quiet, long-wearing Carey Bridge Plank is the answer to your bridge traffic surfacing problems. Skid-resistant, tough Asphalt Plank shows virtually no wear whatsoever!



Carey Elastite Expansion Joint in easy-to-handle sections cut to your requirements, prevents buckling and cracking of pavements. Resilient.

Asphalt Plank is just one of the many products in the Carey "Elastite Line" for roads, bridges, air strips, swimming pools, concrete and masonry construction. The coupon below will bring you complete information. Mail it today. Or, ask your Carey Industrial Sales Engineer to call.

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Dept. EN-8

Without obligation, please send me free catalog giving complete data on Carey Elastite Products.

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registered professional engineer. Prior to his appointment as commissioner, he was Gov. Marland's administrative assistant.

Sawyers has designated district engineer Vincent Johnkoski as his administrative assistant and has named M. L. O'Neale, an engineer formerly with the commission as chief engineer.

Joins Air Pollution Board

Ford J. Twaits, partner in Ford J. Twaits Co., Los Angeles contracting and engineering firm, has been elected to the board of trustees of the Air Pollution Foundation.

An independent, scientific research organization with headquarters in Los Angeles, the foundation conducts research into the causes of air pollution. It began its operations last year and has projects under way in laboratories across the country.

As a trustee, Twaits will serve on a 35-member board, representing industry, commerce, business, education and science.

Asphalt Institute Names A New District Engineer

John B. Dunbar of Montgomery, Ala., has been appointed by the Asphalt Institute to fill the new post of district engineer for Alabama and Tennessee, with headquarters in Montgomery. He will serve under the direction of Herbert Spencer, Division Engineer in New York, whose division embraces the eastern and gulf seaboard as far as Texas.

The new district engineer is a graduate of Alabama Polytechnic Institute and has been with the Alabama State Highway Department for 16 years. As senior assistant in the department's Bureau of Materials and Tests, he has been directing soils and materials surveys and the listing and use of materials.

Dunbar's appointment brings to 24 the number of field engineers employed by the Asphalt Institute.

Ohio Turnpike Commission Names New Project Manager

Russell S. Deetz of Worthington, Ohio, has been appointed project manager for the Ohio Turnpike, with headquarters in the turnpike administration building in Strongsville.

He joined the commission in 1952 as traffic and safety engineer and has been project manager for the Eastgate Section of the turnpike since last February. In his new post, he will be responsible for the operation

Flexibility like this pays off underground

This 28-ft-long Beth-Cu-Loy culvert pipe is flexing under its own weight to illustrate one of the special advantages of pipe fabricated from galvanized Beth-Cu-Loy sheet steel: its flexibility. And flexibility pays off several ways underground.

Flexibility allows the pipe to conform to irregular grades in the trench. It permits the absorption of changing loads caused by shifting soils or freezing action. And because a culvert made from Beth-Cu-Loy is flexible both transversely and longitudinally it can withstand greater impact and vibrational stresses than rigid materials.

Drainage pipe made of Beth-Cu-Loy has other advantages, too. Weighing only a fraction as much per foot, it can be handled in longer lengths than comparable pipe of other materials. It requires fewer field joints, and no special lifting equipment.

Bethlehem does not fabricate drainage pipe, but does manufacture the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel carries a heavy coating of zinc and has excellent resistance to corrosion. It more than meets the specifications of the AASHO.

If you would like to have further information about Beth-Cu-Loy, or the names of those who fabricate it into pipe, just get in touch with the nearest Bethlehem sales office.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

"The most important thing I know about cranes is . . .

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Air-operated controls — and a crane that is always ready to go to work. Torque-Controls for smooth, accurate handling . . . and almost no clutch wear or adjustment. Short wheel base and only *six tires* so that it can turn and travel in any aisle big enough *for a truck.*

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ORTON

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and maintenance of the 241-mi toll road, which is scheduled to open Oct. 1.

A civil engineering graduate of Ohio State University, Deetz began his career with the Ohio Department of Highways in 1935 as an instrument man on a surveying crew. After serving for five years as as assistant engineer in construction, he moved into the field of traffic engineering in which he later obtained a degree at Yale University. At the time he joined the Turnpike Commission, he was chief traffic engineer for the Ohio Department of Highways.

West Coast Firm Reassigns Two of Its Top Executives

J. P. Wiseman has been named head of the newly established products company of Fluor Corporation, Ltd., with headquarters in Los Angeles.

For the past two years he has been president of Fluor Corporation of Canada, Ltd., Canadian affiliate of the Los Angeles firm which serves as engineers, constructors and manufacturers for the petroleum, chemical, petrochemical, natural and gas power industries.

Wiseman joined the company in 1942 as a project engineer and has been a member of Fluor's board of directors since 1946. He was named president of Fluor of Canada in 1952 with the primary objective of establishing that organization in Canada.

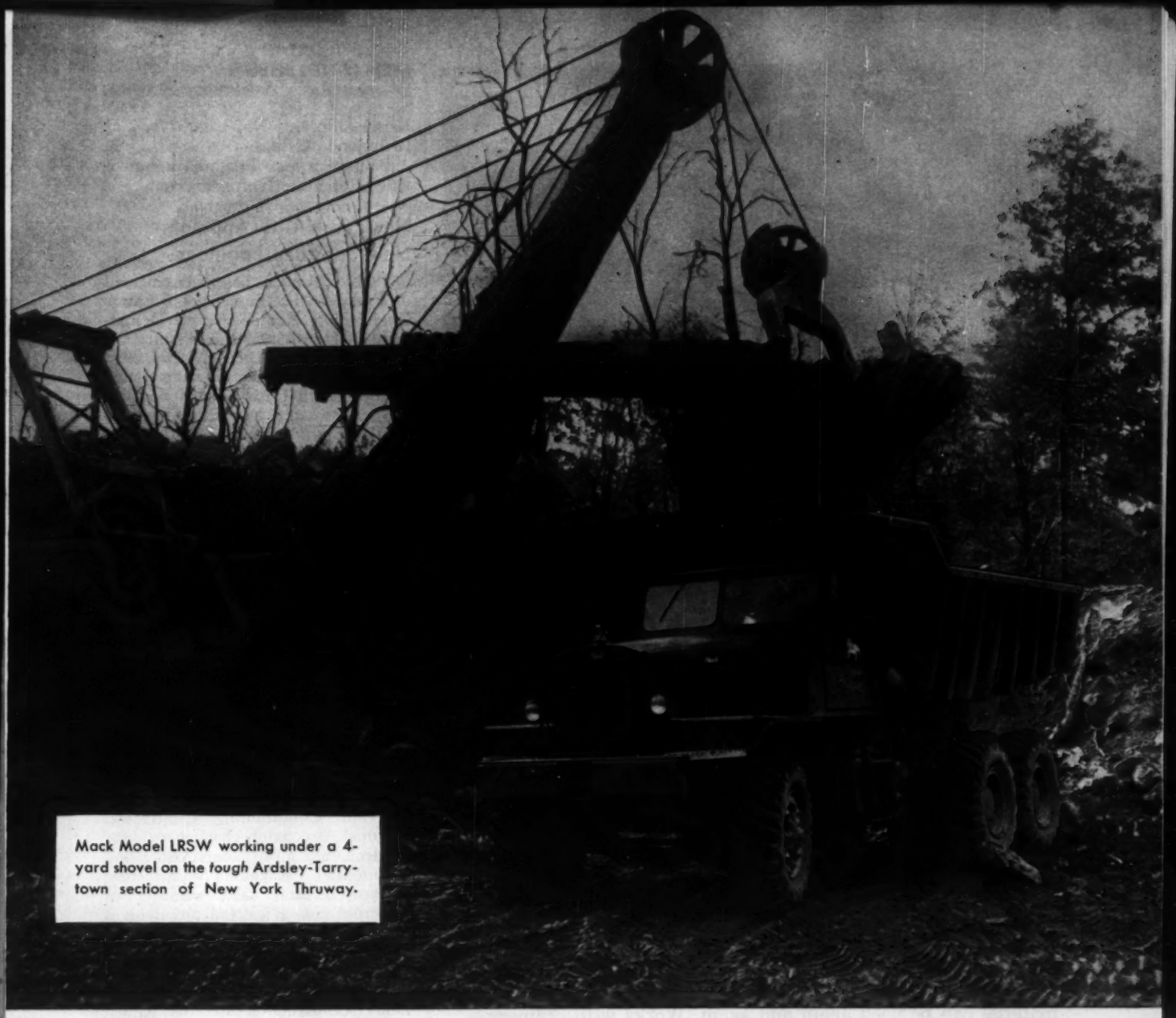
J. G. Bounds, who has been with the company since 1939 will succeed Wiseman as president of the Canadian affiliate.

Both appointments are effective November 1.

Kaiser Engineer Returns To Engineering Division

T. A. Bedford, an executive with various Kaiser affiliated companies for the last 23 years, has joined Kaiser Engineers Division of Henry J. Kaiser Company as vice president. He returns to the Oakland, Calif., headquarters of the company after 10 years in the automotive field.

Bedford joined the Kaiser organization in 1932 during construction of Hoover Dam on the Colorado River, and later participated in the building of Grand Coulee Dam on the Columbia River. In 1940, he was named general superintendent of shipyard construction at Mare Island Navy Yard and two years later became construction superintendent, and subsequently assistant general manager, of



Mack Model LRSW working under a 4-yard shovel on the *tough* Ardsley-Tarrytown section of New York Thruway.

big shovels call for big trucks

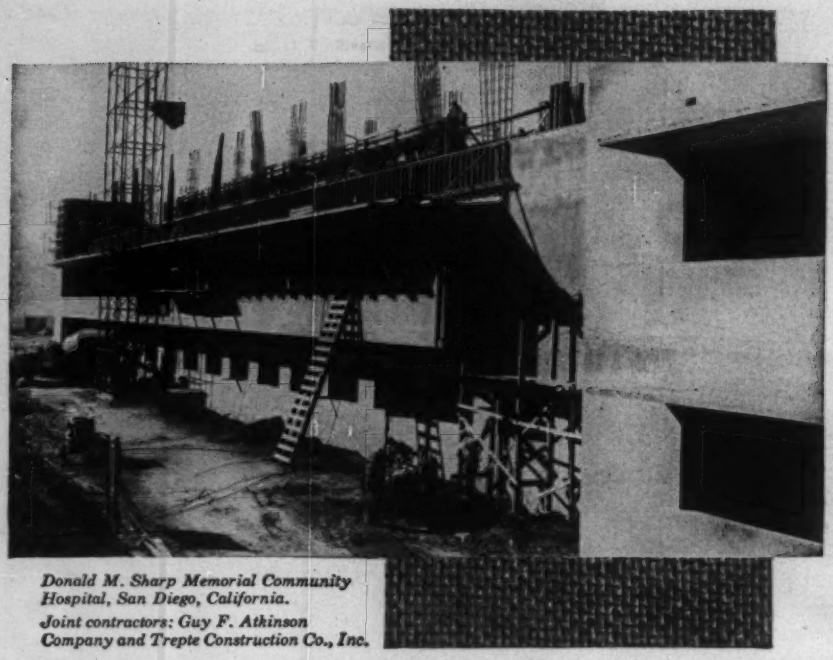
Today's big-yardage jobs demand maximum loads per haul and faster time cycles from shovel to dumping point and return. Increasing use of big 4- and 5-yard shovels points to the Mack Model LRSW six-wheel dump truck as the answer to these stepped-up requirements.

Here's a truck that's built to keep big shovels on the go . . . to give contractors increased production per driver and per truck dollar invested.

Rated at 30 tons payload capacity, it will move 25 heaped yards with unfaltering ease over the toughest terrain. No miring in with Model LRSW—it has the advantage of Mack's Balanced Bogie with exclusive Power Divider, enabling it to pull through where other trucks bog down. In actual service Model LRSW has demonstrated its ability to maintain the time schedule of smaller-capacity dumpers.

Why not investigate the big-unit economy of Mack Model LRSW. It will pay you to see these big jobs at work.

MACK TRUCKS Empire State Building, New York 1, N. Y.



Donald M. Sharp Memorial Community Hospital, San Diego, California.
Joint contractors: Guy F. Atkinson Company and Trepte Construction Co., Inc.

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Which way will help you save most?

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2. Screen side to concrete—for painted surfaces. The textured surface left in concrete forms an excellent bond for paint. Only minimum rubbing required.

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Ask your contractor friends about their experience with this tough, strong hardboard. See what they say about savings in time and costs.

You'll profit other ways, too. This grainless, knot-free panel material can be used again and again. Works with ordinary tools. Large 4′ x 8′ and 4′ x 12′ panels handle easily, create fewer fins. Sold by lumber and building materials dealers everywhere. Send for free sample.

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Firm.....

Address.....

Town.....*Zone*.....

County.....*State*.....

Kaiser Shipyards No. 1 and No. 2 at Richmond, Calif.

Bedford is a civil engineering graduate of Stanford University.

New York City Appoints New Sanitary Engineer

Harold Romer has been named director of the Bureau of Sanitary Engineering, New York City Department of Health, to succeed Albert N. Aeryns who has retired.

As director, Romer will be in charge of the Health Department's work on the city's water supply, sewage disposal, pollution control, refuse disposal, swimming pools and bathing beach activities. The bureau works in collaboration with the Department of Water Supply, Gas and Electricity on matters involving water supply, and with the Department of Public Works on those relating to sewage disposal and pollution control.

At the time of his appointment, Romer was assistant director of the bureau. He entered city service in 1951, after serving as chief sanitary engineer of the Veterans Administration for the State of New York and Island of Puerto Rico.

Men and Jobs Briefs . . .

• **Associations**—The Heating, Piping and Air Conditioning Contractors National Association changes its name to **Mechanical Contractors Association of America** . . . **Raymond W. Sweeney,** western division sales manager of Ruberoid Co., is elected president of the Building Materials Exhibitors Association.

Carl H. Walker, formerly with Duffy Construction Co., is named manager of the Cincinnati chapter of National Electrical Contractors Assn. . . . **C. L. Meanor,** of Natco Corp., Pittsburgh, Pa., is elected president of the Clay Flue Lining Institute . . . The Engineering Society of Toledo names **Henry H. Kerr,** vice president and executive engineer of Toledo Edison Co., as president . . . The South Carolina concrete products manufacturers form a state-wide organization with **S. Green,** of Rock Hill Concrete Co., as first president.

• **Careers**—The Arizona Highway Department appoints **W. E. Willey** state highway engineer, and **G. E. Lang** state maintenance engineer . . . **H. Kenneth Anderson** becomes chief engineer of the Portland, Ore., water bureau, succeeding **B. S. Morrow,** who retired after 47 years of service

. . . **L. M. McConnell,** of Council Bluffs, Iowa, is named city manager of Wilson, N. C.

Otto E. Sargent, president of the California Building and Construction Trades Council, is appointed to the San Francisco Bay Area Rapid Transit Commission . . . **Wade Brown** is named to the newly-created post of city sanitary engineer for Durham, N. C., and continues to serve as assistant superintendent of the city water and sewer department . . . The Federal Housing Administration appoints **Charles R. Watson,** Arkansas building contractor, as head of the Arkansas insuring office of the FHA . . . **J. S. Mills,** former engineer of contracts and specifications, becomes assistant deputy state engineer in the Arizona Highway Department . . . **John W. Behling,** expressway engineer, is appointed regional planning director for the county of Milwaukee, Wis.

• **Business**—Irving L. Lazere, president of the New York City Building Contractors & Mason Builders Association and vice president of the Wilaka Construction Co., forms the Lazere Construction Corp. in New York . . . The Weitz Company, Inc., Des Moines, Iowa, construction firm headed by **Heinrich and Rudolph Weitz,** celebrates its 100th anniversary . . . **E. A. Miller** is appointed general manager of the Fenestra Building Panel Division of Detroit Steel Products Co.

Libbey-Owens-Ford Glass Company promotes engineer **Harold L. Knapp** to assistant chief structural engineer . . . **Howell T. Hunt** is appointed sales engineer for Raymond Concrete Pile Co.'s Los Angeles district . . . **John Magill Mitchell, Jr.,** joins Simons and Hapham, oldest architectural firm in Charleston, S. C., which changes its name to Simons, Lapham and Mitchell.

• **Retirements**—On Aug. 16, **S. W. Hodgin,** who has been city engineer in Richmond, Ind., for nearly 25 years . . . Los Angeles city engineer **Lloyd Aldrich,** after 22 years of service—he'll become a part-time consultant to the city, assisting in completion of the city's $60-million sewerage expansion program . . . **John Edwards, Jr.,** as general manager of the Eastern Region of the B & O Railroad Co., after 44 years of service . . . **B. J. Garnett,** Spokane city engineer, after 45 years of municipal engineering work . . . **Edward R. Stapley,** professor of civil engineering and dean of Oklahoma Institute of Technology will retire Sept. 1, after serving 30 years on the faculty of Oklahoma A&M.

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International Steel Co. All Structural Steel

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That's the complete — and completely integrated — steel fabricating service which has won International nation-wide favor. We'll consider it a favor to work with you, too, on any project involving any form of fabricated steel.

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AGAIN FIBERGLAS ACOUSTICAL FORM BOARD DOES 3 BIG JOBS AT ONE LOW COST

New drug warehouse built swiftly on low budget →

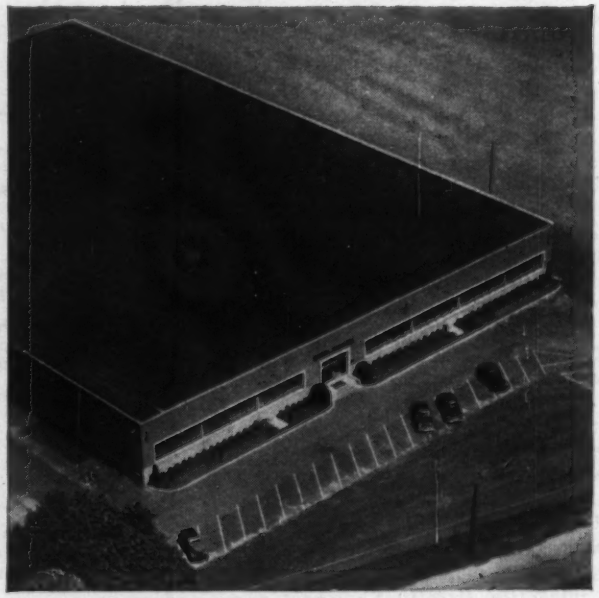
Fiberglas* Acoustical Form Board does *three* jobs—it's a form board for the roof deck; a highly efficient roof insulation, and fire-safe acoustical ceiling.

A fine example of its versatility is the new Towns & James drug distribution center in Westbury, Long Island. The builders, Kretzer Construction Company, are specialists in this kind of high volume, high efficiency design.

The roof area added up to 60,000 sq. ft. A lightweight truss construction supports Fiberglas Acoustical Form Board, which in turn is covered with a gypsum deck. This simple design enabled Kretzer to keep costs down while freeing up the maximum warehouse space.

Form board with gypsum deck construction is highly efficient thermally—cuts heating costs in winter, improves summer comfort. It provides a fire-safe acoustical ceiling and because it's made of inorganic fibers of glass, it won't rot or decay, warp or buckle.

Get to know Fiberglas Acoustical Form Board for *your* low-budget projects. See our catalog in Sweet's File, or write: Owens-Corning Fiberglas Corporation, Dept. H-145, Toledo 1, Ohio.



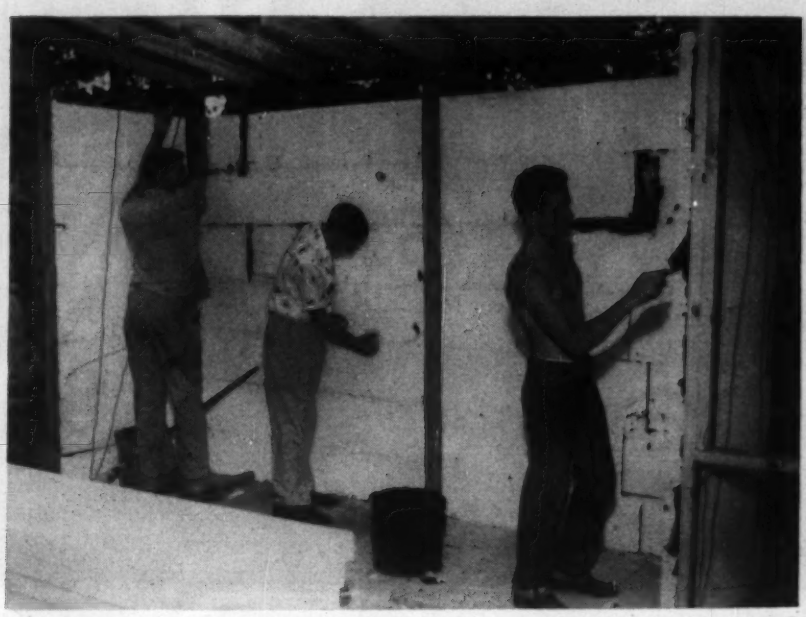
Builder: *Kretzer Construction Company*
Architect: *Hurley & Hughes & Chas. M. Lobejager*
Roof Deck Contractor: *Keystone Fireproofing Company*

OWENS-CORNING FIBERGLAS

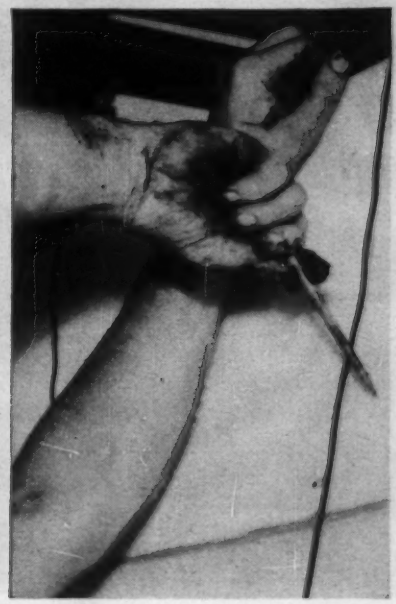
ACOUSTICAL FORM BOARD

Sound Control Products • Roof Insulation • Electrical Insulations
Duct Insulations • Low Temperature Insulations

*T. M. Reg. Owens-Corning Fiberglas Corporation.



FOAMED PLASTIC is used for load-bearing walls as well as roof shingles and subflooring. Wall panels are tightly butted with joints staggered, then compressed.



WOODEN SKEWERS are used to secure horizontal joints in Styrofoam panel wall.

Foamed Plastic House Tied With Wires

What is probably the first residence to be built of Styrofoam—a foamed plastic produced by the Dow Chemical Co.—is now under construction in Houston, Tex.

Not only are the load-bearing walls constructed of the material, but the builder intends to use the expanded polystyrene for the roof and in conjunction with marble flooring in one room.

For the walls, Styrofoam boards measuring 9 ft x 1 in. x 3 in. are placed on top of one another with all joints staggered and tightly butted. Weight of each board is about 4½ lb. Vertical seams are filled with waterproofing compound and the horizontal members are pegged together with wooden skewers.

Eye-bolts staggered along the floor and ceiling receive steel wires which are laced over the wall sections to compact the boards. The 3-in. walls are then given a 1-in. coating of air-placed concrete to produce a finished 5-in. thick wall.

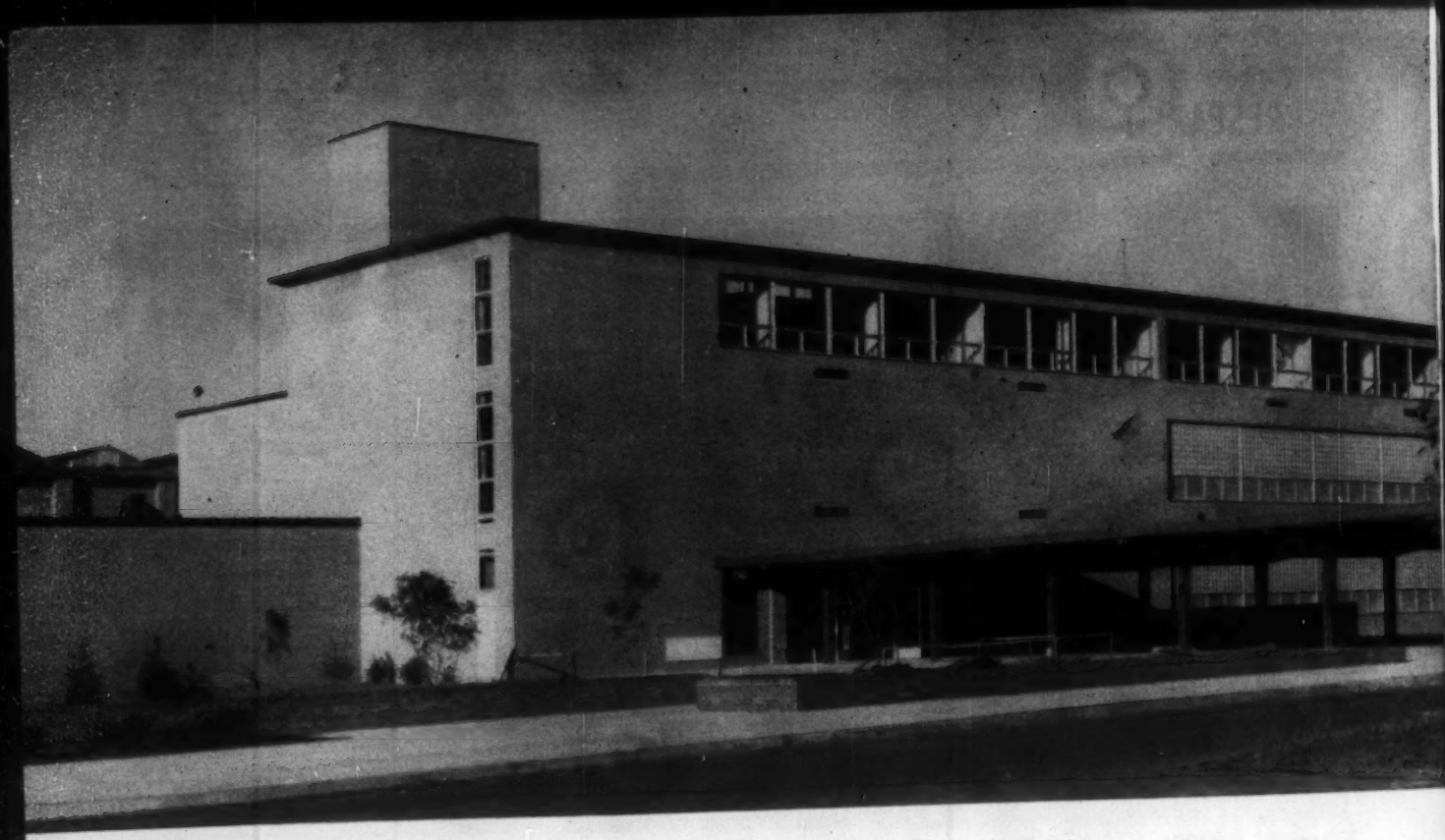
According to Dean Emerson, who is building the 3,200 sq ft house for his own occupancy, the cost of the wall is about 85¢ psf whereas a 4-in. brick veneer and insulation wall would run about $1.25 psf.

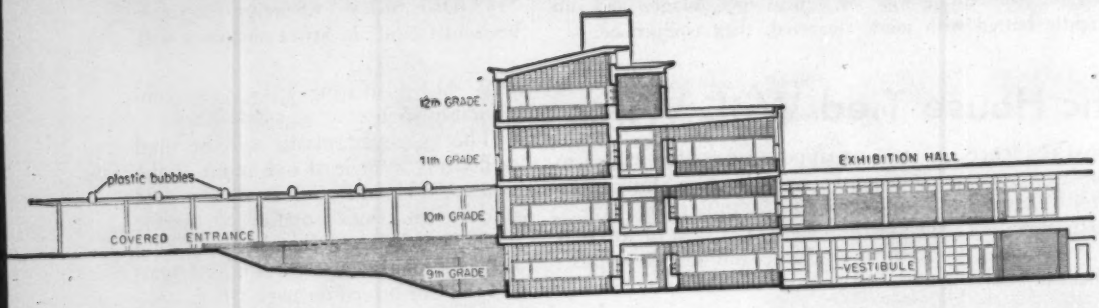
The roof is a conventional four-ply, built-up type covered with Styrofoam shingles 9 ft x 18 in. x approximately 3 in., overlapped and coated with ¼ in. of cement. Actually, the shingles are 2½ in. thick on the upper edge and 3¼ in. on the lower. The cost of the roof, according to the builder, is approximately the same as the usual shingle roof, but insulating values are considerably higher.

The expanded plastic will be used as flooring in at least one room of the house. The material is to be laid under ¼-in. thick squares of marble and it is presumed that this will help keep the marble at a comfortable tem-

(Continued on page 105)

AIR-PLACED CONCRETE is sprayed on walls to a depth of 1 in. on both sides. Note compressing wires which run through eye-bolts staggered on floor and ceiling.





How a school was designed at savings of 31% in floor system costs

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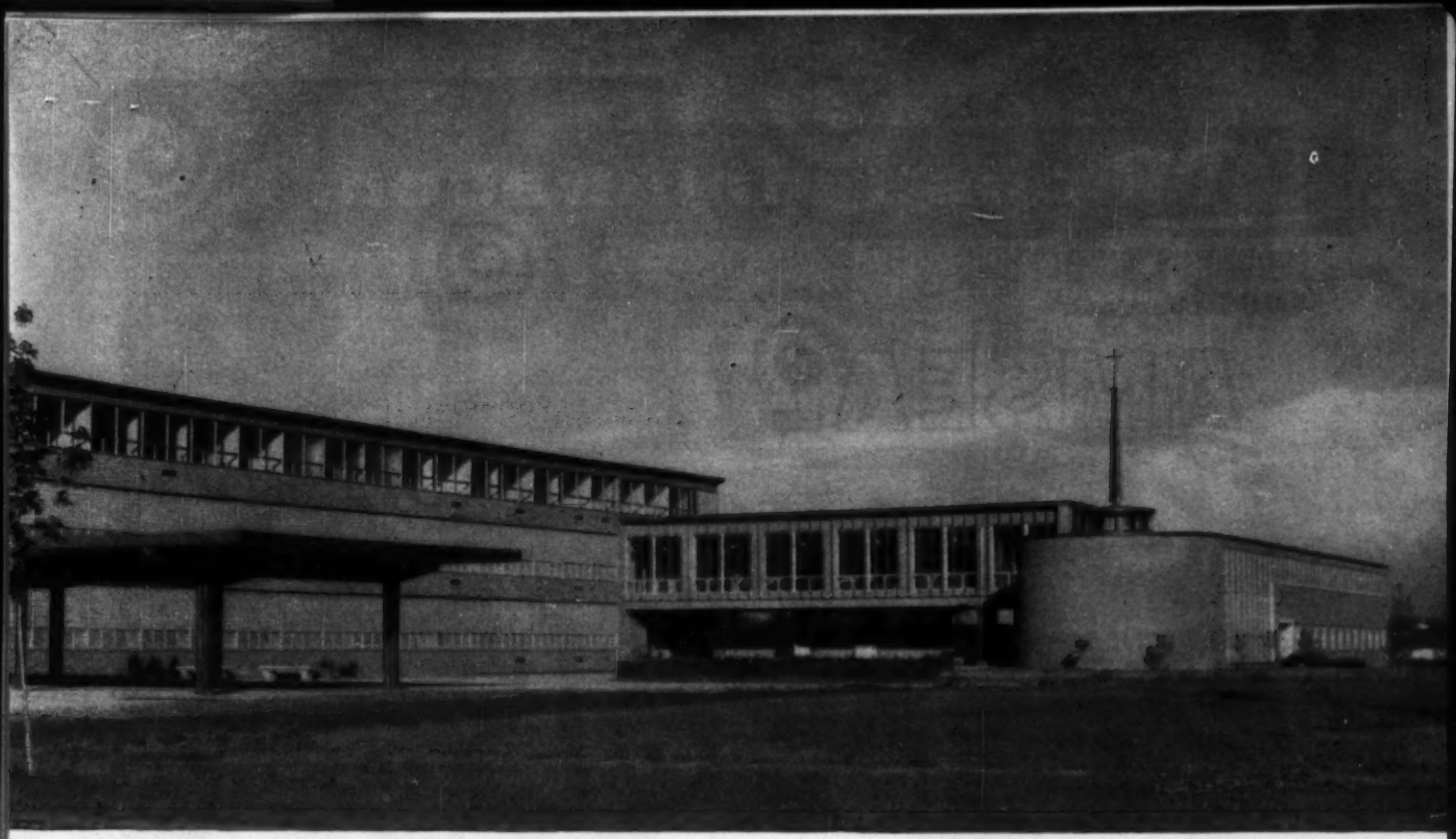
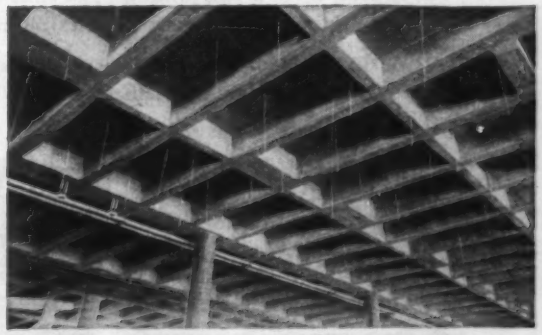
In construction products CECO ENGINEERING makes the big difference

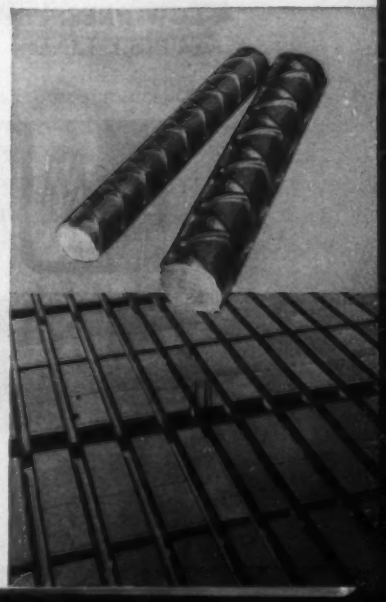


Bishop DuBourg High School—St. Louis, Missouri
Architects: Murphy & Mackey/Structural Engineer: Neal J. Campbell
Contractor: C. Rallo Contracting Company, Inc.

Ceco-Meyer Removable Steelform Construction proves more economical than solid slab or tile filler in study made for Bishop DuBourg High School in St. Louis. When a school is designed around a program planned jointly by architects and educators, it is possible to cut costs and at the same time satisfy functional and psychological needs. So goes the story of Bishop DuBourg High School. Architects Murphy & Mackey asked the school administrators to outline physical requirements and spiritual essentials. On the basis of that data, they created a pupil-centered school with a warm, human atmosphere instead of an institutional feeling. The building is four stories high, with each floor a one-grade school in itself . . . classes stacked one above the other. Common facilities, including library, shop and gymnasium, are tied in so students can reach them without walking through corridors used by other grades. With layout settled, methods of construction then got a critical eye, Floor systems studied were (1) solid slab and (2) concrete joist construction formed with (A) tile filler and (B) removable steelforms. Ceco-Meyer Removable Steelforms were selected on the basis of 31% savings in cost over solid slab and 27% over tile filler. Reasons for savings: less forming lumber, concrete, steel and labor than solid slab; less material cost than tile filler. Also the Ceco method was deemed the most practical and fastest for rigid fire-safe construction. So on your next building project consult Ceco Engineers in the preplanning stage. Chances are they can help you on advance programing so savings can be made in time, material and labor.



Underside view of concrete joists formed with Ceco-Meyer Removable Flange-Type Steelforms, showing tie-wires for ceiling attachment.



Ceco Reinforcing Steel was fabricated in accordance with design drawings. Delivery was made to the job site as required by the contractor's construction schedule, thus saving double handling on the job.

View of Ceco-Meyer Steelforms in place, ready for placement of reinforcing steel.

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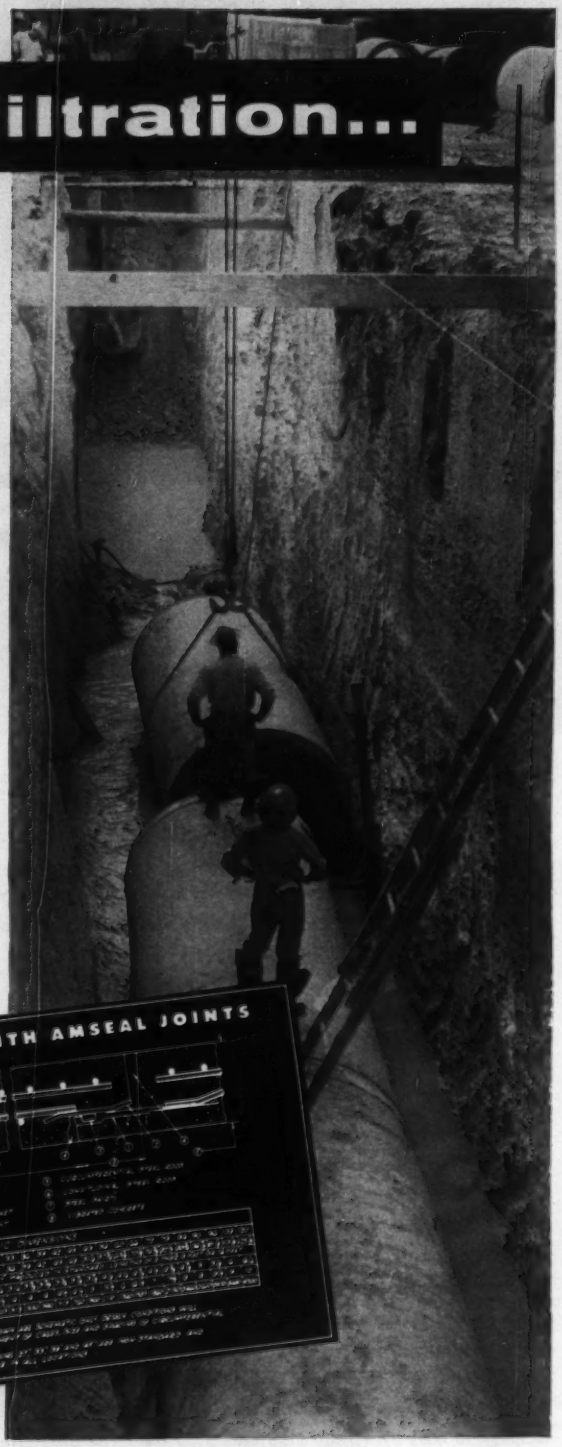

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Contractors appreciate the simplicity and economy of installing precast concrete pipe furnished with foolproof AMSEAL Joints—particularly where trench conditions are wet and troublesome. The continuous, round rubber gasket assures a watertight seal against infiltration or leakage. AMSEAL Joints provide the necessary flexibility to permit normal expansion, contraction, deflection and settlement without reducing their effectiveness.

The efficiency and long life of AMSEAL Joints results in *greater economy*—through savings in the construction, operation and maintenance of sewage pumping and treatment facilities. With pipe lengths of 16 feet, there is less joining—less time on the job. Inside surfaces are smooth for maximum capacity.

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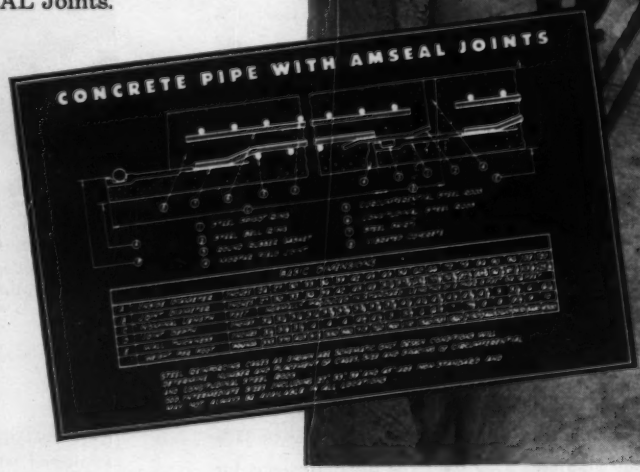

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perature. Further, the plastic underflooring permits the laying of the marble in thin pieces and thus reduces costs.

According to Mr. Emerson and his co-developer, Francis J. Niven, consulting engineer of Houston, Tex., the highly insulated home will offer tremendous savings in air conditioning and heating. A home this size normally requires a 5-ton air conditioning plant and 150,000 Btu for heating; the Emerson house is said to require only a 3-ton plant and 80,000 Btu.

The house is built to withstand a uniform windload of 70 psf—more than twice the minimum code requirements, and through the use of the plastic will be rot, vermin and waterproof. As far as cost is concerned, the builder believes that this type of home can be built for 10 to 15% less than the usual type offering similar construction advantages.

Cheaper Power

High temperature steam studies mean cost cuts

While cost of nearly everything else has been rising over the past decade, cost of electric power to the home consumer has been declining; and its price to commercial and industrial users has at least not risen. Thanks are due largely to research which has made it possible for central station generating plants to improve their efficiency, using increasingly higher steam temperatures and pressures.

Further efficiency will come harder —due to two factors. First is the severe corrosive action of high-temperature steam; second is the lack of metallurgical stability of the materials available for superheater tubing.

The corrosion problem has been under attack for years. From 1936 to 1942 a special research committee of The American Society of Mechanical Engineers sponsored work on it at Purdue University. This research, financed by Engineering Foundation, Purdue University, and industry, was discontinued during the war and reestablished in 1949 as a project to study the posibility of using a regenerative steam cycle at temperatures up to 1650 F.

Four factors are being studied at the present time; properties of the oxide films formed on steel exposed to high-pressure steam at temperatures between 1100 and 1500 F; resistance of superheater steels to the gases encountered with commercial fuels; metallurgical stability of the materials during high-temperature service for periods up to three years; and effect of repeated thermal shock.

Laboratory tests with synthetic atmospheres have been completed, as have field tests in eleven different generating units. According to these tests, several available steels are capable of satisfactory service when delivering steam at temperatures up to 1200 F—except when certain types of residual oils and waste fuels are burned.

• **Vital work coming**—New tests that promise to be widely significant will be made at the Philip Sporn Plant of the American Gas and Electric Company, where steam is available at 2,000-psi pressure and 1000 F temperature. For these tests, special apparatus has been designed in cooperation with the U. S. Navy Bureau of Ships.

It will be some five or six years before the test program at the Sporn plant can be completed, as exposure of the specimens for a minimum of three years is necessary.

The effect on heat transfer of the corrosion products formed by steam on the inside of steel tubes is now being studied in special equipment designed and installed at Purdue University. In this project, steam is passed through a counter-flow heat exchanger and electric superheater connected in series, which will deliver steam at 1000 F. The steam is then passed through two identical heat exchangers in series, one of which contains a clean tube and the other a corroded tube of the same steel. By measuring the flow and the temperature rise through the two heat exchangers in series, effect of the scale on heat transfer can be determined. The thickness of the scale and its metallurgical characteristics will also be determined.

Contributions to the research program from equipment manufacturers, utilities, trade associations, and the Engineering Foundation (25-year-old endowed organization made up of ASCE, AIMME, ASME and AIEE) are expected to reach $200,000. To this must be added the contribution of engineering services provided by the Navy Bureau of Ships for the design and fabrication of the testing equipment, which is estimated at $125,000, plus the time and effort of those who have formulated the program.

Inquiries concerning the program may be addressed to Prof. H. L. Solberg, chairman of ASME's Committee on High-Temperature Steam Generation, and head of the School of Mechanical Engineering at Purdue University, Lafayette, Indiana.

(Research continued on page 106)

Ask the man behind the gun . . .

White gives you everything you want in an engineer's transit

Shown, model 7014 with "A" standard. "U" type also available. $673.00 complete with tripod case and field equipment.

WHY are more and more engineers and builders choosing White Engineers' Transits? Basically, the reason is simple: White transits are designed and built for the man in the field. They incorporate all the work-saving, accuracy-boosting features . . . the rugged construction . . . the simplified quality components that you want. In addition, you get coated optics, covered leveling screws and internal focusing Telescope. Wide frame tripod is optional.

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Fig. I Cross hair arrangement for our standard levels.

Fig. II Stadia hair arrangement for our standard transits.

Fig. III Special stadia hair arrangement, furnished upon request.

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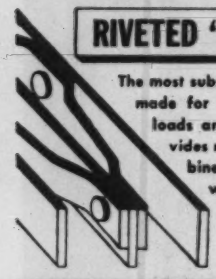

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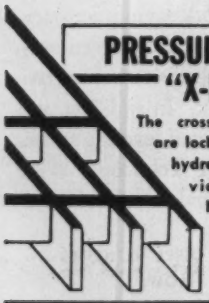
The cross and bearing bars are locked under tremendous hydraulic pressure to provide a strong, safe, lightweight floor. X-Bar Grating is self-cleaning and most economical.



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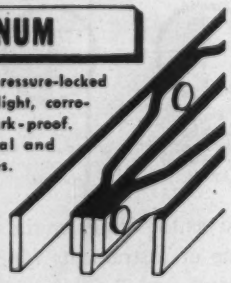

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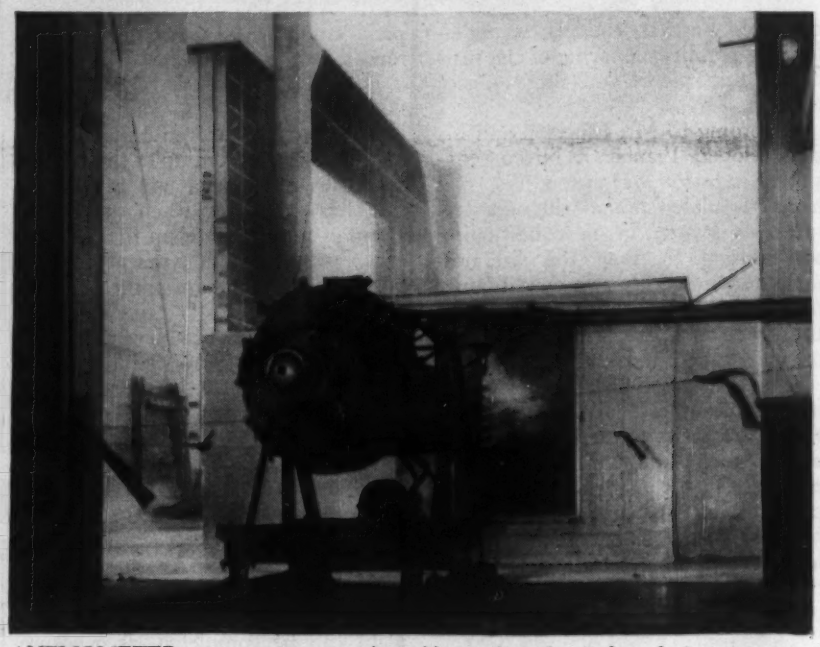


ANEMOMETER measures passage of air blown through window during test.

Window Testing Can Prevent Headaches

The architect's final choice of windows for his building may be a difficult or a relatively simple decision. When it involves over 750 separate window units in one project one thing is sure—the decision is going to be an important one.

With this in mind it is not surprising, that the subject of windows for Standard-Vacuum Oil Company's administrative headquarters in Harrison, N. Y. was approached with some caution.

The bay module for the sprawling double-Y shaped building is 18 ft. Three 6 x 6-ft window units per bay were desired, extending almost without interruption around the building on all three stories.

As the building is to be fully air conditioned, infiltration through the windows (which must be operable for cleaning and in case of mechanical breakdowns) had to be kept to a reasonable minimum. Too, the actual water leakage under severe weather conditions through the large window units might be extremely destructive. It was decided to find out just how great these two factors—infiltration and leakage were in a window of standard design.

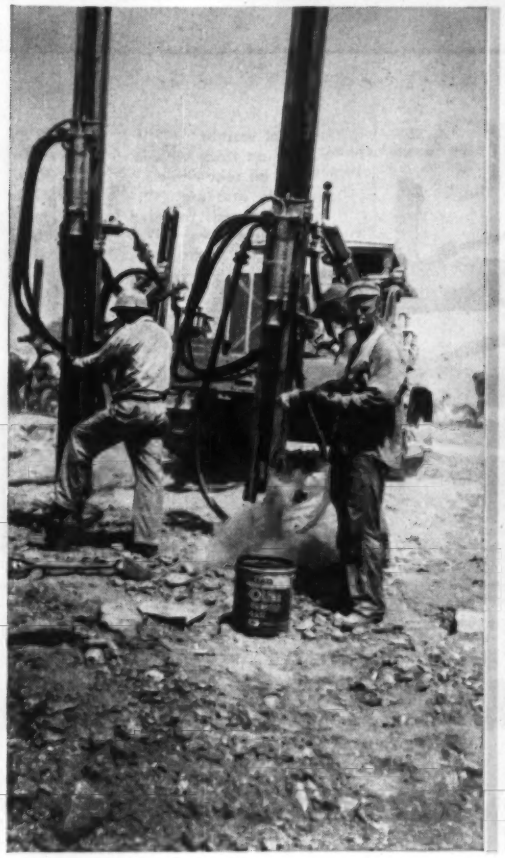
Accordingly, a major manufacturer was asked to construct a window of the desired size and of standard detailing and submit it to a routine test in the company's own laboratories. The test was made, but both leakage and air infiltration were too high.

Andrew J. Eken, President of the construction company, (Starrett Bros, & Eken, Inc.,) knew that soon after the war the University of Miami had established, under the direction of Professor Albert W. Hainlin, a laboratory for the testing of building materials under hurricane conditions. He suggested that various window manufacturers be asked to submit specially detailed 6 x 6-ft windows, both pivoted and single-hung, and that the University of Miami tests be applied to them. In that way, he reasoned, a solution might be found to a detailing problem which has plagued many an architect and engineer, and cost many an owner extra dollars in maintenance.

Three leading aluminum window manufacturers were approached and all agreed to provide one or more "guinea pig" models, so constructed that they would be as weathertight as the companies' designers could make them. Seven windows, two single-hung and five pivoted, were submitted. The tests were carried out under the supervision of Professor Hainlin and his staff, and a representative of each manufacturer was present when the tests on his company's windows were carried out.

Present for all the tests were: Ernest H. Staber, representing the owner Standard-Vacuum Oil Co.; David L. Eggers of Eggers and Higgins, Architects; Andrew J. Eken, President, Briton H. Richardson, Vice President, and John Kakerbeck, Research Engineer, all of the building firm; John

(Continued on page 110)



Making Time on the N.Y. Thruway!

Le Roi 600 cfm compressor and Cleveland T-286 drill rig speed drilling operation

Motorists aren't the only ones who travel fast on the N. Y. Thruway. Contractors had to make plenty of time, too.

That's why this contractor made a mobile drilling unit out of his D-8 Cat. He used as components a Le Roi 600 CTM compressor and the Cleveland T-286 drill rig.

The compressor is designed especially for use with D-8 or TD-24 tractors. It is the only unit that attaches directly to the PTO and has a clutch as well. Capacity of the unit is 600 cfm.

The T-286 drill rig consists of two Cleveland patented air feeds, and Cleveland 4" drifters with air-motor booms. Here, it is mounted on the front of the tractor and has a spread of 220 degrees suitable for any variable drill pattern. Ten-foot steel changes, faster set-ups, better hole spacing, greater footage, better fragmentation—mean faster drilling and lower costs.

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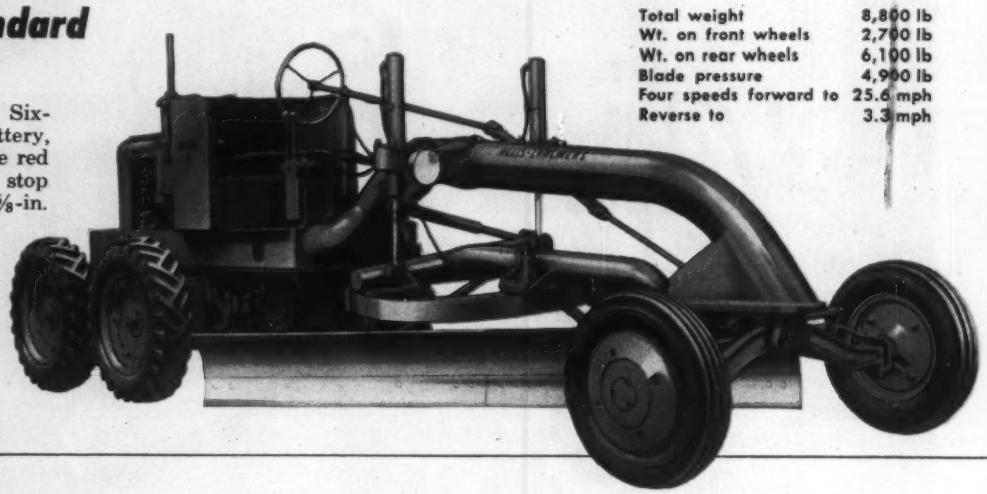
Model D *Standard*

(GASOLINE ENGINE)

Standard Equipment: Six-volt electric generator, battery, two white headlights, one red combination rear and stop light, muffler, 10-ft by 5/8-in. moldboard, hydraulic controls for moldboard lift, four 7.50-20 (6 ply) rear and two 6.50-16 (6 ply) front pneumatic tires with regular tubes.

Total weight	8,800 lb
Wt. on front wheels	2,700 lb
Wt. on rear wheels	6,100 lb
Blade pressure	4,900 lb
Four speeds forward to	25.6 mph
Reverse to	3.3 mph



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from the Allis-Chalmers model D motor grader line

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Total weight	9,350 lb
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Blade pressure	4,900 lb
Four speeds forward to	25.2 mph
Reverse to	3.2 mph

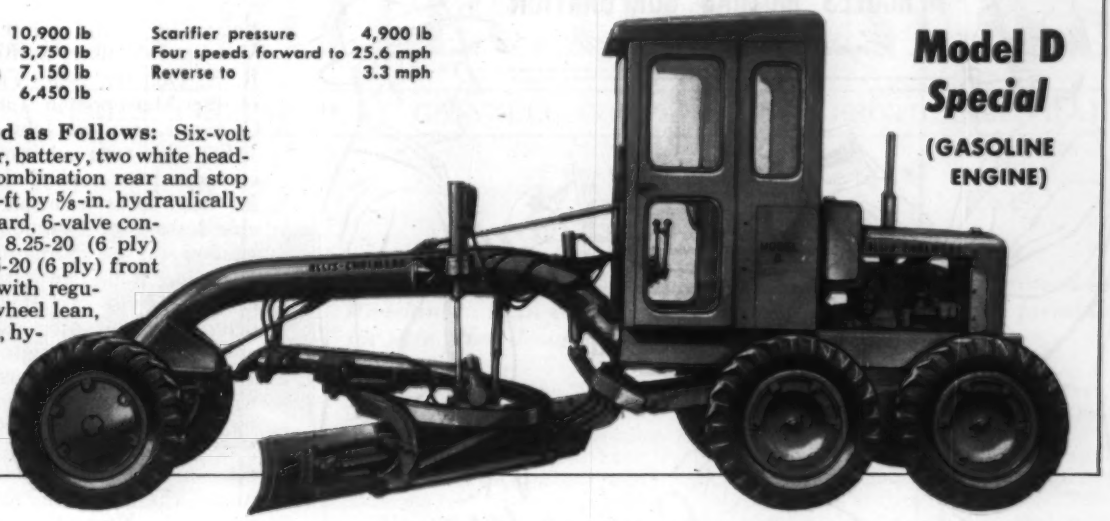
Standard Equipment: Twelve-volt electric generator, battery, two white headlights, one red combination rear and stop light, muffler, 10-ft by 5/8-in. moldboard, hydraulic controls for moldboard lift, four 7.50-20 (6 ply) rear and two 6.50-16 (6 ply) front pneumatic tires with regular tubes.

Both gasoline and diesel Model D's are available with any combination of accessories.

You can still buy a Model D for one-third the cost of a large motor grader, and it's the most popular, most versatile small grader on the market. In addition to the units illustrated, the Model D is available with other combinations of accessories . . . or with any of these useful attachments: rear-mounted 5/8-cu-yd loader; shoulder maintainer; one-pass windrow eliminator; V or blade-type snowplows. Ask your nearby Allis-Chalmers dealer for a demonstration . . . and prove the Model D's value to yourself.

Total weight	10,900 lb	Scarifier pressure	4,900 lb
Wt. on front wheels	3,750 lb	Four speeds forward to	25.6 mph
Wt. on rear wheels	7,150 lb	Reverse to	3.3 mph
Blade pressure	6,450 lb		

Fully Equipped as Follows: Six-volt electric generator, battery, two white headlights, one red combination rear and stop light, muffler, 10-ft by ⅝-in. hydraulically shiftable moldboard, 6-valve control group, four 8.25-20 (6 ply) rear and two 8.25-20 (6 ply) front pneumatic tires with regular tubes, front wheel lean, power circle turn, hydraulic scarifier, all-steel cab.



Model D *Special*

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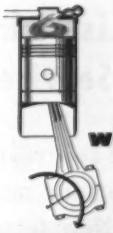
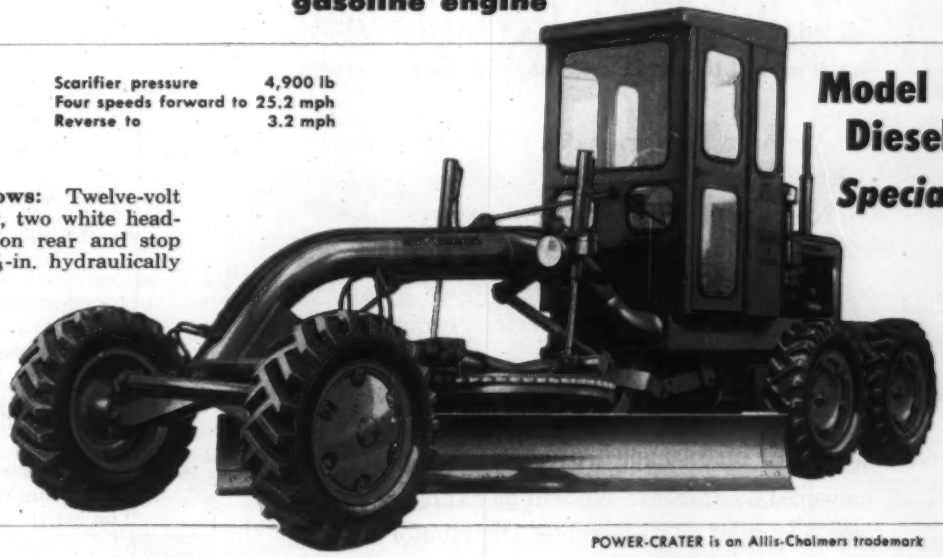
50-hp POWER-CRATER gasoline engine



50-hp diesel engine with follow-through combustion

Total weight	11,450 lb	Scarifier pressure	4,900 lb
Wt. on front wheels	3,750 lb	Four speeds forward to	25.2 mph
Wt. on rear wheels	7,700 lb	Reverse to	3.2 mph
Blade pressure	6,450 lb		

Fully Equipped as Follows: Twelve-volt electric generator, battery, two white headlights, one red combination rear and stop light, muffler, 10-ft by ⅝-in. hydraulically shiftable moldboard, 6-valve control group, four 8.25-20 (6 ply) rear and two 8.25-20 (6 ply) front pneumatic tires with regular tubes, front wheel lean, power circle turn, hydraulic scarifier, all-steel cab.



Model D Diesel *Special*

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Loughnane of the architctural firm of Voorhees, Walker, Smith & Smith; R. E. Doherty, Asst. Vice President of the Metropolitan Life Insurance Co.; and architect John P. Jansson.

For the tests additional caulking compound was applied along the glazing bead so as to insure no measurable leakage at this point and each window was placed in a mock-up stud-and-siding wall. The testing was then carried out in two stages so as to determine most carefully and accurately infiltration through the operable sash elements alone. First, the entire window assembly including the mock-up wall was subjected to a 12-min test simulating severe weather conditions and the total amount of air and water leakage in the assembly was measured. Next, the operable sash was sealed to the mock-up wall so that no leakage could occur, and the same 12-min test was run on the assembly to obtain a measurement of whatever leakage occurred in the wall alone. The result obtained in the second stage which was negligible was subtracted from the measurement taken during the first stage, to obtain an accurate figure for operable sash leakage alone.

The weather conditions simulated during the 12-min tests were winds of 100 mph accompanied by the equivalent of 4 in. of rain per hour, sustained for 10 min against the surface of the window; and the same rainfall condition together with gust winds of 120 mph for the remaining 2 min.

The wind and water test was generated by one 1,500 horsepower Wright Whirlwind engine secured to a stand and operating a triple blade propeller. The water was supplied by pipe, released near the engine and blown against the windows. Water leakage was collected in a trough and measured at the end of each test run. Air infiltration was measured by an anemometer placed at one end of cone shaped metal housing secured over window opening inside the test house.

Under the laboratory conditions described above, only two of the windows leaked and air infiltration in all seven was negligible.

The actual results of this test may not be revealed except directly through the participating companies, but in general all windows passed the basic test enabling them to be termed "hurricane-proof".

While the test results indicated that the reversible windows were somewhat better than the single hung sliding window, the sliding type window was selected because of the architectural requirements.

FIRE PROTECTION NEWS

NO. 1 IN A SERIES, PUBLISHED BY GRINNELL COMPANY, INC., PROVIDENCE, R. I.

Fire Razes Factory

Flames leveled two factories and several other buildings, despite valiant efforts of firemen to check the blaze. Damage was estimated in the hundreds of thousands of dollars. Several people were seriously injured. Another case of the high cost of NO SPRINKLERS.

313 Fires Cause $202 Millions of Damage

Last year hit a new, all-time high for "large loss" fires, those that exceed $250,000. A total of 313 big fires were reported in the United States and Canada. Most of the increase in the number of fires occurred in the mercantile classification, which jumped from 29 fires in 1953 to 54 last year. Warehouse and other storage areas rose from 48 to 54 and the transportation section climbed from 39 to 57. In commenting on the large fire loss, National Fire Protection Association said: — "Most of the large loss building fires in 1954 would not have occurred had the buildings been completely protected by a properly installed and maintained sprinkler system. The value of a complete sprinkler system is certainly obvious."

Chemical Plant at Height of the Fire

This is the way the Arnold Hoffman Chemical Plant in Dighton, Mass. looked while a fire "raged" inside. The fire, however, never amounted to much, because a Grinnell Automatic Sprinkler System went into operation, snuffing out the fire instantly. Damage was negligible and no one was injured.

FIRE PROTECTION IS GOOD BUSINESS

E. J. Meyers, Assistant Manager, Safety and Fire Protection Division, E. I. du Pont de Nemours & Company, gives his formula for safe plant design

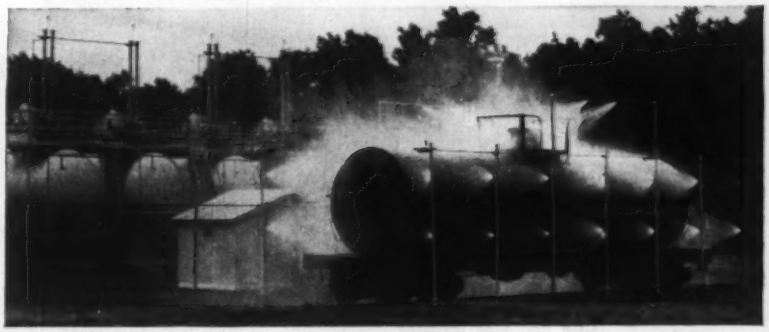
Speaking before the Massachusetts Institute of Technology's Conference on Fire Protection Engineering, Mr. Meyers expressed some basic facts which deserve a wider audience. Excerpts from this speech follow:

"Fire protection has always been an important part of good business . . . fire protection begins with the design of the plant — buildings, equipment and processes. The object is to remove, as far as possible, the human factor by making protection permanent or automatic.

". . . In the minds of many, fire prevention and fire protection are confined largely to care in preventing or safe-guarding the common causes of fire, such as the use of matches, smoking, spontaneous combustion of oily rags, and of defects existing in lighting. To be effective, however, every factor affecting safety to either life or property must be included.

". . . The automatic sprinkler system is undoubtedly the most extensively used fire protection device. This is mainly due to the fact that it is automatic in action and always on the job in any part of the property equipped, provided it is properly installed and maintained. It prevents destruction of property, interruption to operations, and the loss of lives. A majority of fires are small at the start and can usually be put out with a small amount of water. The sprinkler automatically supplies this water at the needed time without the aid of human agency, provided it is a standard installation properly maintained and backed up with adequate water."

GRINNELL PROTECTOSPRAY SYSTEM COOLS OFF LP-GAS TANK CAR

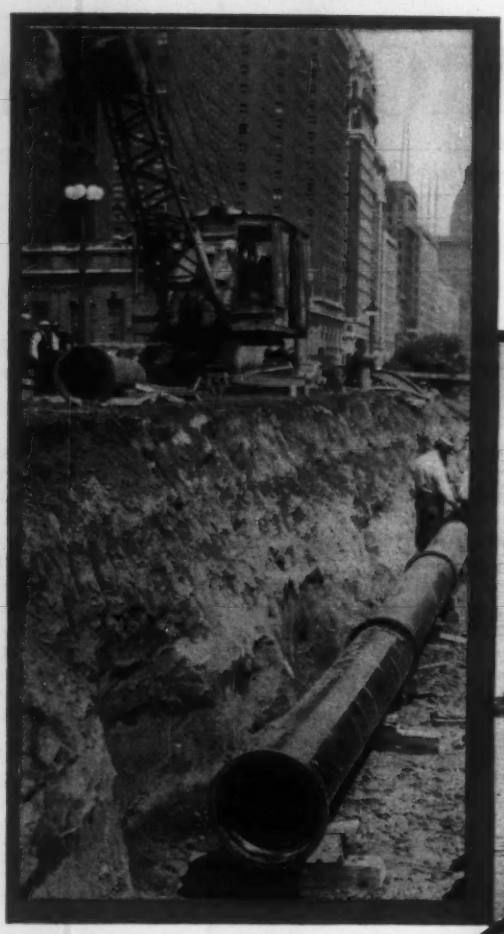


This tank car full of liquefied petroleum gas is at a siding where its contents will be transferred to industrial storage tanks. The Grinnell ProtectoSpray System, in test operation, is a modern fire-prevention and fire-control water spray system.

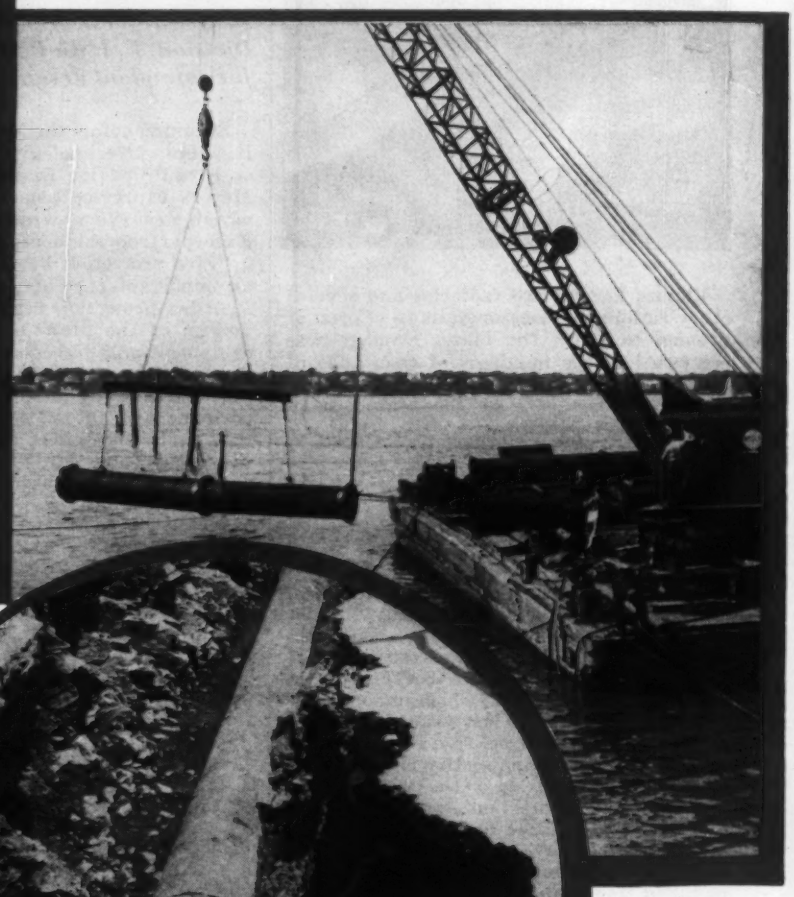
Without such protection any leak brings the chance of fire or explosion. With the Grinnell ProtectoSpray System, the hazard is practically eliminated. The drenching water blanket provides instant cooling, to reduce tank pressures and prevent rupture. Positive air turbulence is created, even in still air, to help dilution of leaking gas by the inert gases present in air. Water-vapor dilution assists in thinning out gas-air mixtures toward the point where they will no longer burn. And fire, if it occurs, is localized, permitting safe disposal of the gas by burning where it escapes, thus reducing the fire-explosion hazards downwind or downgrade.

Grinnell ProtectoSpray is just one of the many systems engineered to protect special hazards. Water spray, air foam, carbon dioxide, and dry powder systems are available to protect all classes of hazards.

Serves so well....



Installing 16" cast iron pipe for water line in Chicago, Ill.



Installing 12" Standardized Mechanical Joint pipe for Fall River Gas Works Co., Fall River, Mass.

Cast iron pipe installed for East Providence, R. I., Sewage Treatment Plant.

CAST IRON PIPE

so many ways

A list of the many applications in which cast iron pipe serves so well might surprise you. Check them off. In *water* service—fire protection and supply lines, feeder and distribution mains, purification plants. In *gas* service, mechanical joint cast iron pipe is widely used for distribution mains. In *industrial* service, applications are almost endless in petroleum, process, chemical, paper and other industries.

Where effective resistance to corrosion and sustained carrying capacity are indispensable to long life and economy, specify cast iron pipe with confidence. For information write Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3, Ill.

CAST Q IRON ®

The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

Standardized Mechanical Joint pipe water line installed in Mobile, Ala.

36" flanged Ell with special base for Chicago filtration plant.

SERVES FOR CENTURIES...

TRENCHING 7 MILES of Indianola Avenue, a heavily traveled thorofare in Columbus, Ohio, called for a fast-moving job. The first step in opening the ditch was to line-cut and break a 7″ course of paving brick topped with asphalt. Two 80 lb. breakers, powered by a Jaeger "125" Roto Air-Plus, were used for this work.

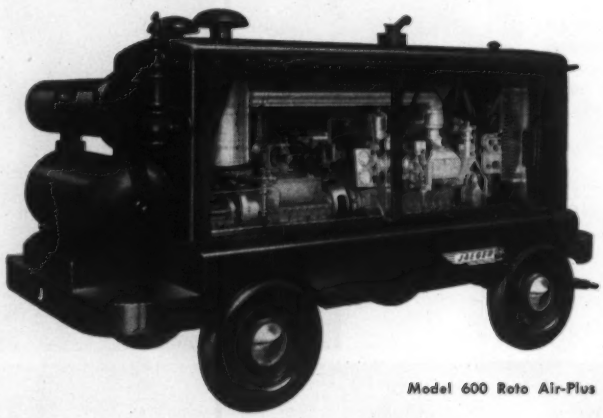
How Jaeger "125" Rotary speeds street work

On the above job, the instant-acting control of the Jaeger rotary, enabling it to maintain 100 lbs. minimum pressure under all air demands up to 125 cfm, made it possible to run two 80 lb. breakers at full efficiency, cutting and breaking an average of 400 linear ft. of 3 ft. wide trench (1200 sq. ft.) each 8 hours.

Because the higher efficiency of the Jaeger Roto enables it to operate at more economical engine speeds, fuel consumption on this job averaged only 1½ gallons an hour.

For big work, equally high efficiency is offered in the Jaeger Model 600 rotary. Jaeger reciprocating type compressors also continue to be available in all Jaeger "new standard" ratings with the exception of the 600 cfm size. For full information and comparative prices, see your Jaeger distributor — or send for Catalogs JC and JCR5.

For big work, Jaeger offers the Roto "600", illustrated below. It is the first fully efficient 600 cfm rotary compressor.

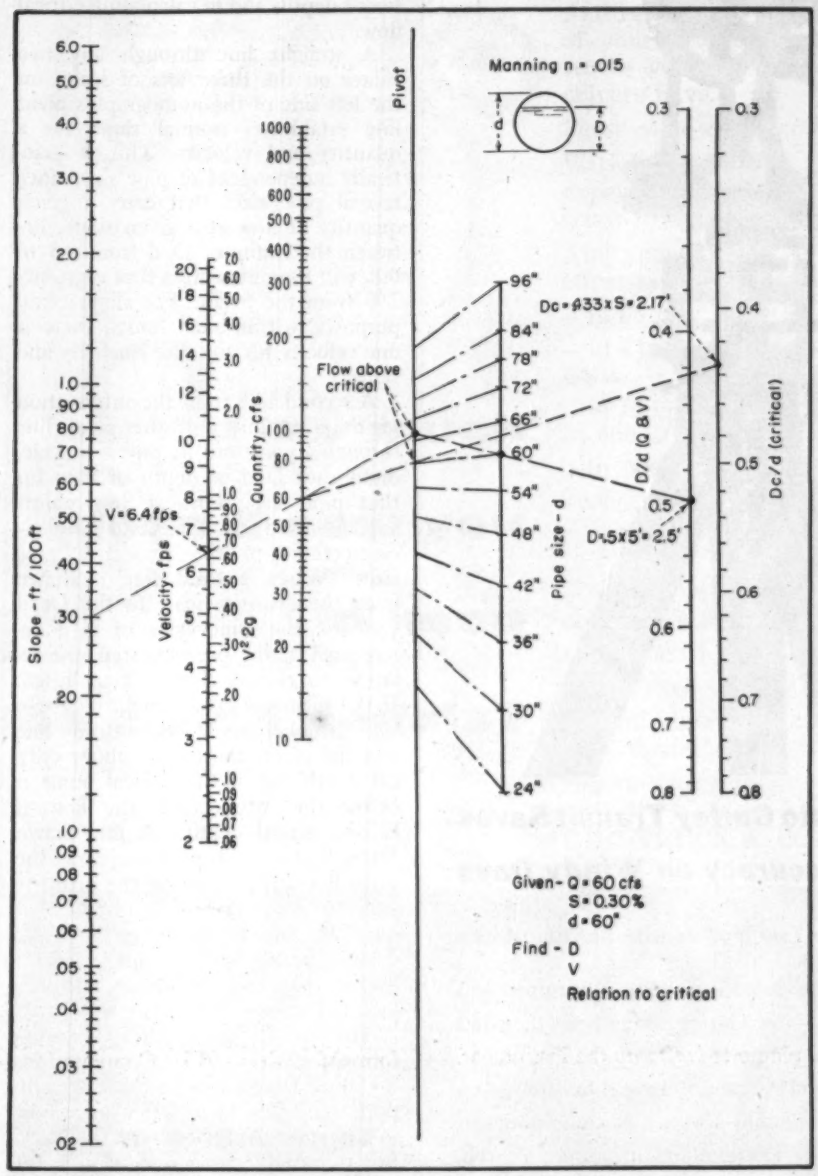


Model 600 Roto Air-Plus

THE JAEGER MACHINE COMPANY

200 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • TRUCK MIXERS • LOADERS • PAVING MACHINES



Cut out and use this . . .

Time-Saver for Culvert Design

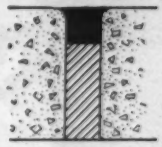
Anyone who has done hydraulic computations for depths less than full in circular pipe knows the tedious work necessary in the many trial and error steps. The nomograph presented here accomplishes such computations in a fraction of the time required for longhand methods.

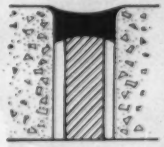
Other labor savers similar to this nomograph are available, but several charts—one for each hydraulic function or one for each pipe size—are needed to accomplish the same results. This nomograph has the advantage of presenting all the possibilities of design at a glance on one sheet.

The nomograph was developed as a time saving device in the design of highway culverts laid on steep grades. In such culverts the pipe size is controlled by the entrance conditions, but it is important to know what flow pattern occurs in the pipe from the entrance to the outlet. Velocities must be found to determine the scouring effect on the pipe itself as well as on the channel at the outlet.

Invaluable aid has been provided

Servicised
PARA-PLASTIC JF JOINT SEALER
RESISTS SOLVENTS AND JET FUEL SPILLAGE


Temperatures to 180°F do not affect Para-Plastic sealing efficiency


Para-Plastic JF remains plastic, maintains bond at sub-zero temperatures

Airport runway and apron joints sealed with Para-Plastic JF — an exclusive Servicised development—will stay sealed in temperatures from sub-zero to 180°F and resist the disintegrating effects of fuel or petroleum solvent spillage. Para-Plastic JF forms a resilient, adhesive and effective plastic seal that insures maximum joint protection. Can be pumped directly from melting kettle into the joint — a fast, low cost method of application.

Write for complete details on Para-Plastic JF today.

SERVICISED PRODUCTS CORPORATION
6031 W. 65th ST., CHICAGO 38, ILL.

Goldblatt
"fresno" concrete trowel
$11.50
f.o.b. Kansas City, Mo.

1,056 tools

FREE TOOL CATALOG—1,056 tools for trowel trades. 100-page illustrated book. Send name on postcard.

Exceptionally fine quality single-action "Fresno" trowel. Preserves balance despite roughest use. Tempered, ground and polished spring-steel blade is permanently riveted to sturdy aluminum mounting. Includes 6-ft. Ash handle with heavy steel ferrule. Fully adjustable. 30"x5" trowel size, order No. 30-SA. Check, money order or C.O.D. Fully guaranteed.

GOLDBLATT TOOL COMPANY, Dept. G8
1928 Walnut, Kansas City 8, Mo.

New Optical Plummet Built into Gurley Transit Saves Set-up Time, Improves Accuracy on Windy Days

Instrument Available in Two Models with Shifting Heads

Years ago, Gurley introduced lightweight instruments to combat wind vibrations. Now Gurley further beats the wind problem with an optical plummet *built into* the instrument.

The new Gurley Optical Plummet Transit eliminates swing and sway of the cord and plumb—always time-consuming and exasperating on a windy location, and inaccurate as well. Positive accuracy of set-up is assured with the Gurley Optical Plummet.

Two types of shifting head are available: one, which uses the Gurley wide-frame tripod, is adjusted over the point—using a method similar to the theodolite...the other, featuring a slow-motion, two-direction cross-feed head, permits movement in two directions at right angles to each other without disturbing the level of the plate.

Gurley's new Optical Plummet Transit offers one of the advantages of the optical-reading theodolite *plus* the desirable features of simplicity and universal acceptance of the American transit. For further details, write for Bulletin OP-57.

GURLEY

W. & L. E. GURLEY Union Plaza, Troy, New York

Gurley—Since 1845

by the nomograph in solving drawdown curves, finding velocities at different depths and in calculating critical flow.

A straight line through any two values on the three sets of scales on the left side of the nomograph's pivot line establishes normal slope for a quantity and velocity. This is practically independent of pipe size, since several pipe sizes that carry a given quantity of flow at a given slope, between the limits of D/d from 0.3 to 0.8, will have flow areas that vary only 2% from the mean. For all practical purposes, within such limits, there is one velocity for any flow quantity and slope.

A second line from the intersection of the first line and the pivot line through a point on the pipe size scale, establishes D/d or depth of flow for that pipe size. Critical flow points are indicated on the pivot line by connections to the respective pipe sizes. When a third line is drawn from the quantity scale to the Dc/d scale for the same value of D/d determined in the previous step, the relation to critical flow is established. If the pipe size critical point is above the intersection of this third line and the pivot, the flow is above critical depth and if the critical point is below the intersection, the flow is below, critical depth. A line drawn through the critical point on the pivot line and a value on the quantity scale indicates critical depth for that quantity on the Dc/d scale. The velocity head scale has been added for use in problems involving entrance loss and energy.

The chart uses the Manning formula with n-.015. Computations for other factors can be made by proportioning flow to n/.015. Since flow in a pipe for depths between 0.8D and full is unstable, and since design for low depths of flow is not economical, the nomograph has been limited to values of D/d of 0.3 to 0.8. Uniform flow problems can be solved directly and all the hydraulic values requiring tedious calculations in non-uniform flow problems are available.—GEORGE P. FULTON, BROWN & BLAUVELT, NEW YORK, N. Y.

Selling Safety Like Soap

Humorous slogans on Burma-Shave style road signs keeps the serious problem of forest fire constantly in the minds of workers on Hydro-Quebec's Bersimis project deep in northeastern forests of the province. Sample: One tree makes—a million matches—one match might destroy—a million trees.

How much does it cost you to keep the clutch pedals?

The figures are right on your books. Just add the charges of all those clutch replacements – of all their repairs – of all overhauls of overtaxed engines – of all the extra service work on axles and drive-lines damaged by shock-load starts.

And remember – these "fixed" costs are eating chunks out of your profits no matter what kind of standard-shift trucks you use or how much clutch-and-shift skill your drivers have.

These costs will shrink with Hydra-Matic GMC's*

With self-shifting GMC's, you not only reduce those expenses – but cash in on reduced down time and longer truck-life to boot.

And you can now have all Hydra-Matic's timesaving – effort-saving – truck-saving advantages...

– in 65 new Blue Chip models ranging up to 70,000 GCW

– in 7 two-cycle Diesel models from 30,000 GVW to 70,000 GCW

– in 15 new dual-purpose cab models from 16,000 GVW to 55,000 GCW

– in 9 c.o.e. "Stripaway" models from 32,000 GVW to 70,000 GCW

– in 9 rugged new tandem-axle models from 28,000 GVW to 70,000 GCW

– teamed with a wide choice of Blue Chip power plants – sixes, V8's and Diesels – from 125 to 230 h.p.

– in Blue Chip GMC's with greater-than-ever ruggedness

– improved turning ability

Get full details on any one of them – right now – at your GMC dealer's!

**Hydra-Matic standard on many models; optional at extra cost on some others*

GMC TRUCK & COACH – *A General Motors Division*

Your Key to Blue Chip Value

See GM Diesels at work at the
GENERAL MOTORS
POWERAMA
Lake Shore Drive, next to Soldier Field, Chicago
August 31 through September 25

How to make a school foundation
water repellent, sturdy and *long lasting*

THOROSEAL
Foundation Coating

Correct procedure is shown here, where foundation is given 2 brush coats of THOROSEAL Foundation Coating, immediately after construction forms are removed.

Poured concrete exterior walls and tunnel walls, 2 coats of Foundation Coating, and inside concrete block walls, 2 coats of THOROSEAL

Bagley School
Pontiac, Michigan
Architect—William Zimmerman
Contractor—Nolan Gottschall

NO MAINTENANCE COST HERE!

THOROSEALING the foundation walls of this new school building, means less upkeep, less repairs. Water cannot penetrate masonry now and cause costly damage.

Get our pictorially described literature
"HOW TO DO IT"
STANDARD DRY WALL PRODUCTS INC.
NEW EAGLE, PENNSYLVANIA

LEGAL

Liability for Damages Caused by Blasting

In a recent Massachusetts case,[1] the court has this to say about blasting operations: "Under our decisions one carrying on blasting operations is liable without proof of negligence for all direct injuries to the property of another, as where stones or debris are cast upon it; but in the absence of negligence there is no liability for consequential harm such as is caused by concussion or vibration."

However, the New York Court of Appeals has held[2]: "The law exacts from a person who undertakes to do even a lawful act on his own premises, which may produce injury to his neighbor, the exercise of a degree of care measured by the danger, to prevent or mitigate the injury. The defendant could not conduct the operation of blasting on his own premises, from which injury might be apprehended to the property of his neighbor, without the most cautious regard for his neighbor's rights. This would be reasonable care only under the circumstances. If it was practicable in a business sense for the defendant to have removed the rock without blasting although at a somewhat increased cost, the defendant would, we think, in view of the situation, and especially after having been informed of the injury that was being done, have been bound to resort to some other method. There is evidence that the rock from some parts of the excavation was loosened by the use of iron bars, and if this was practicable as to all of it the jury might well have found that this means should have been adopted. So, also, if less powerful blasts might have been used which would not have occasioned injury, or would have lessened it, the omission to use them might well be considered negligence."

Various provisions are often inserted in contracts to avoid some of the pitfalls of blasting. It is not uncommon, for example, for construction contracts to provide that rock adjacent to buildings should be removed by line drilling and wedging and not by blasting.

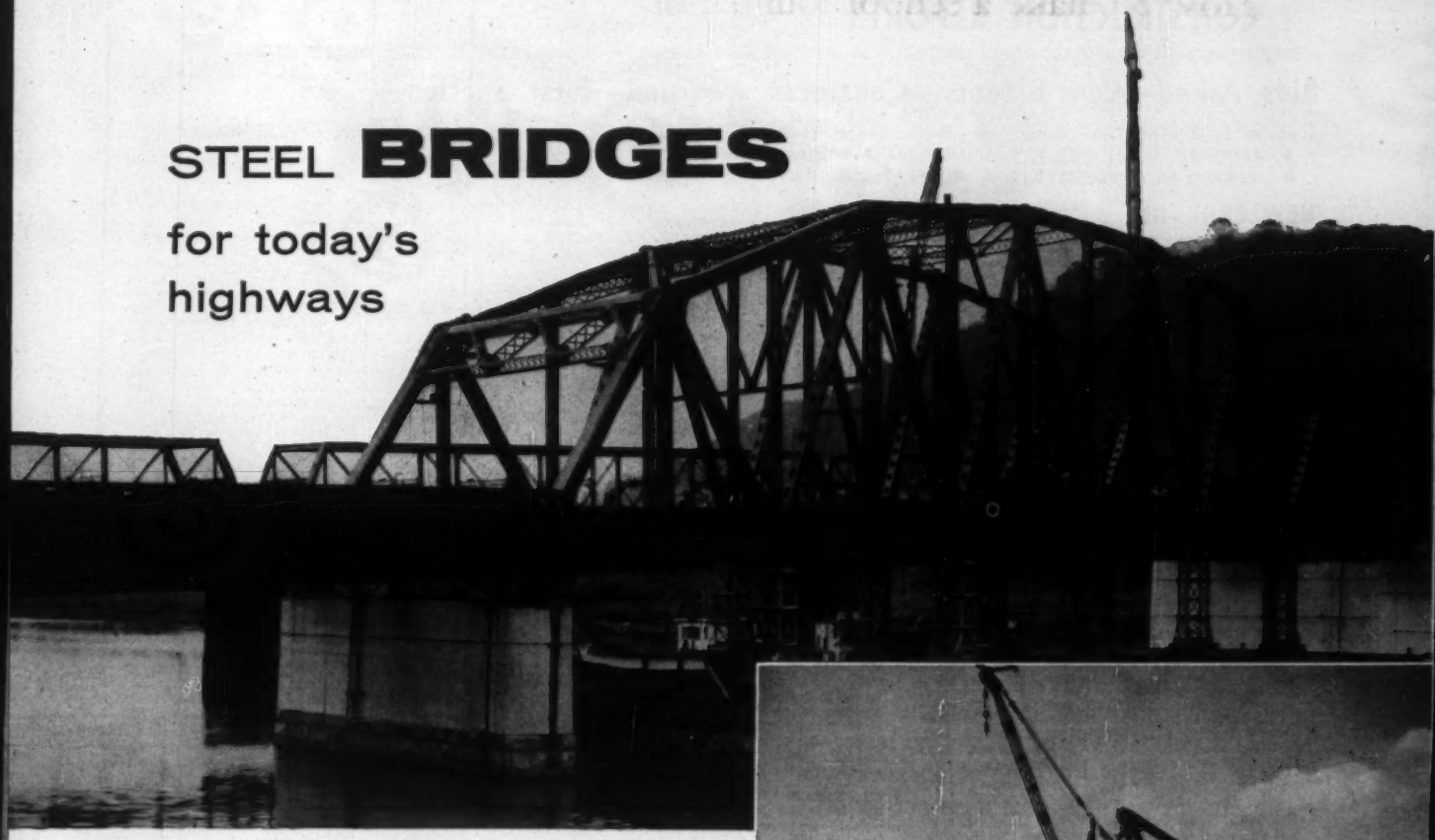
(1) Coughlan v. Grande & Son, Inc., 125 N.E. 2d 778, Judicial Supreme Court of Mass., April 4, 1955.

(2) Booth v. Rome, W. & O.T.R. Co., 140 N. Y. 267.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

STEEL **BRIDGES**

for today's highways



PITTSBURGH ·DES MOINES

Modern highways demand modern bridges wherever roads must "take to the air." For half-a-century, bridge fabrication and erection have been a vital part of our activities, with every advance in design and method reflected in the dependable structures we build. ● The project pictured is the Fleming Park Bridge at Neville Island, Pittsburgh. With an overall length of 804 feet, the bridge has a through-truss channel span of 360 feet, and will accommodate four lanes of traffic, relieving a serious bottleneck in a heavily-travelled area. ● Let us consult on your bridge requirements, and submit a quotation.

PITTSBURGH·DES MOINES STEEL CO.

Plants at PITTSBURGH, DES MOINES and SANTA CLARA

Sales Offices at:

PITTSBURGH (25),.....3414 Neville Island	DES MOINES (8),.....915 Tuttle Street
NEWARK (2),.....216 Industrial Office Bldg.	DALLAS (1),.....1219 Praetorian Building
CHICAGO (3), 1218 First National Bank Bldg.	SEATTLE,.....522 Lane Street
LOS ANGELES (48),.....6399 Wilshire Blvd.	SANTA CLARA, CAL.,.....621 Alviso Road

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† **Connecticut**—SPECIAL AAA FACILITIES—BA On Or About 8/18—U. S. Eng., 857 Commonwealth Ave., Boston, Mass., Special AAA Facilities, Orange and West Haven, Bridgeport area, ENG-19-016-56-3. $900,000-$1,000,000. Plans deposit $50. Extended date. Crandall Eng. Co., 261 Franklin St., Boston, Mass., engr. CD 7/20.

Mass., Boston—BA 8/18—Commonwealth of Mass., Metropolitan Dist. Comn., Constr. Div., 20 Somerset St., Boston, Contr. 221 Sect. 132, Framingham trunk sewer (interceptor) Needham-Wellesley Town Line to Sudbury Aqueduct, 10,000 ft. 48-in. precast rein.-con. pipe, Wellesley, Dover and Natick. $750,000. Plans deposit $10, refundable. CD 12/31/51.

† **Massachusetts**—SPECIAL AAA FACILITIES—BA On Or About 8/26—U. S. Eng., 857 Commonwealth Ave., Boston, Zone 15, Special AAA Facilities for Boston Area at Beverly (Site B-15), ENG-19-016-56-11. $800,000-$900,000. Plans deposit $50. CD 2/3.

BUILDINGS—BA

Conn., New Haven—SCHOOL—BA 8/15—City, Supt. Schools, Justin L. O'Brien, 169 Church St., Bassett Junior High School addn., alterations. $600,000. Plans deposit $50. Lester J. A. Julianelli & Carl R. Blanchard, Jr., 111 Whitney Ave., assoc. archts. Henry A. Pfisterer, 111 Whitney Ave., structural engr. CD 7/5, under LB.

Vt., Burlington—BANK—BA 8/18—Howard National Bank & Trust Co., 116 Church St., bank bldg., St. Paul and Main Sts. $800,000. Plans deposit $25. Freeman, French & Freeman, 138 Church St., archts. CD 1/26.

▲ **Conn., West Haven**—SCHOOLS—BA 8/31—Town, Bd. Educ., Town Hall, Junior High School, Benham Hill Rd., Harry M. Bailey Jr. High School. $1,500,000. Smith & Persse, 956 Chapel St., New Haven, archts. CD 11/27/53.

BUILDINGS—SLC

Vt., Bennington — SCHOOL — Roman Catholic Diocese, Most. Rev. Edward F. Ryan, DD, Bishop of Burlington, Msgr. Thomas J. Burke & Rev. Valmore Desautells, trustees, Chancery Office, Burlington, soon lets contract high school, School St. $500,000. Dirsa & Lampron, 922 Elm St., Manchester, archts. CD 12/7.

HEAVY CONSTRUCTION—LB & CA

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Dooley Bros., Inc., 39 George St., Roxbury, Mass. LB $267,180, est. $265,000. hy. work Hyde Park Ave., Boston. Bids July 26. CD 7/15.

Builders Iron Works, 24 Dane St., Somerville, Mass. LB $931,966, est. $1,000,000. reconstr. Charlestown Bridge over Charles River, BOSTON, MASS. City, Dpt. P. Wks., City Hall Annex, Boston, Mass. Bids July 26. CD 7/13.

John J. Boyle, 55 Centre St., Dorchester, Mass. LB $74,000. (1 bidder) sewage treatment facilities, DEERFIELD, MASS. Town, Bd. Water Comrs., c/o Bd. Selectmen, Grammar School, Main St., Deerfield, Mass. Bids July 25. CD 7/12.

Motorola Sonation Electronics Co., 4501 W. Augusta Blvd., Chicago, Ill., LB $143,490, est. $150,000. furnishing, installing VHF radio MICROWAVE with standby emergency power, PROVIDENCE, R. I. State R. I. and Prov. Plants, P.A., State House, Providence, R. I.

Nichols Engineering & Research Co., 70 Pine St., New York, N. Y. LB $353,498, incineration equipment, etc., WEST HARTFORD, CONN. Town, R. L. Loomis, town mgr., Town Hall, West Hartford, Conn. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs. CD 6/27.

BUILDINGS—LB & CA

Stewart & Williams, Inc., Augusta, Me. CA $728,200, est. $725,000. Women's DORMITORY, ORONO, ME. University of Maine, Orono, Me. Bids July 27. CD 7/15.

▲ **Gilbane Building Co.**, 90 Calverly St., Providence, R. I. CA Approx. $3,000,000. OPS and POWER BLDGS., assoc. facilities, TOPSHAM, ME. Western Electric Co., 220 Church St., New York, N. Y. Bids July 7. CD 6/22.

▲ **Rich Brothers Constr. Co.**, 410 Park Square Bldg., Boston, Mass., LB, $1,677,189. WAR MEMORIAL bldg., Trowbridge and Cambridge Sts., CAMBRIDGE, MASS. City, City Hall, Cambridge, Mass. Bids July 28. CD 7/6.

▲ **Associated Constr. Co.**, 1010 Wethersfield Ave., Hartford, Conn., LB, $1,414,000. junior-senior high SCHOOL, STONINGTON, CONN. Town Bd. of Educ., Stonington, Conn. Bids July 27. CD 7/5.

▲ **A. F. Peaslee, Inc.**, 15 Lewis St., Hartford, Conn., CA $1,391,421, est. $1,385,000. HOSPITAL addn., Spencer St., WINSTED, CONN. Litchfield County Hospital, Spencer St., Winsted, Conn. Sherwood, Mills & Smith, 65 Broad St., Stamford, Conn., archts. Bids July 8. CD 7/18, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† **New York**—SPECIAL AAA FACILITIES—BA 8/25—U. S. Eng., 111 E. 16 St., New York, Zone 3, Special AAA Facilities, at Ontario Ordnance Works, Lewiston, ENG-30-075-56-3, $500,000-$750,000. Plans deposit $100.

▲† **New York**—SPECIAL AAA FACILITIES—BA 8/30—U. S. Eng., 111 E. 16 St., New York, Zone 3, Special AAA Facilities, Orchard Park, ENG-30-075-56-4, $1,000,000-$2,000,000. Plans deposit $100. CD 7/19.

BUILDINGS—BA

N. Y., Cortlandt—SCHOOL—BA 8/16—Bd. Educ. of the Union Free School Dist. No. 2, Towns of Cortlandt and Yorktown, Croton-Harmon High School, Croton-on-Hudson, general constr., plumbing, heating and ventilating, electrical work for Pierre Van Cortlandt School in Town of Cortlandt, Town of Westchester and State of New York. Plans deposit $50. Louis E. Jallade, 597 Fifth Ave., New York, N. Y., archt. adv. ENR 8/11. CD 10/18/45.

† **Md., Rockville** — LABORATORY — BA 8/23 — U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., biologic products research laboratory addn., alterations, Walter Reed Army Medical Center, Forest Glen, ENG-49-080-56-2-(2). CD 11/9/51.

Pa., Phila., SCHOOL—BA About 9/1—Bd. Educ., 21 and Winter Sts., elementary school, 18 and Mt. Vernon Sts. $350,000. Supowitz & Demchick, 246 S. 15 St., archts. Bloom & Dorfman, 1411 Walnut St., consult. engrs. CD 427.

PROJECTS COVERED

By Size

Construction projects here reported cover the Unite States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings, $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listings)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildnigs
Streets & Roads	Industrial Buildnigs
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

Pa., Phila. — AUTO SERVICE — Bids Asked — Kutner Buick, Inc., Castor Ave. and St. Vincent St., auto service bldg., parking lot addn. $93,000. Irvin Michaelson, Fox Bldg., archt.

BUILDINGS—SLC

N. Y., New Rochelle—SHIPPING TERMINAL—Neptune Storage Co., Inc., 369 Hugenot St., soon lets contract, shipping terminal, 9 acre tract, Wegman Ave., $750,000, Horace Ginsbern & Assoc., 205 E. 42 St., New York, Zone 17, archts. CD 6/9.

▲ **Pa., Lancaster**—PLANT—Office A. M. Kinney, Inc., engr., 2905 Vernon Place, Cincinnati, O., soon lets contract, substructure cosmetic plant, parking lot, railroad siding, for Warner Lambert Pharmaceutical Corp., 113 W. 18 St., New York, N. Y. $4,300,000.

Pa., Scranton—SCIENCE—Office Gilboy Bellante & Claus, archts., Mears Bldg., soon lets contract science bldg. for University of Scranton, 200 Wyoming Ave., Scranton, Pa. $960,000.

HEAVY CONSTRUCTION—LB & CA

▲ **Tully & DiNapoli, Inc.**, 127-50 Northern Blvd., Corona, N. Y. CA $1,306,322 (4 bidders) rehabilitation of tracks and contact rail across Jamaica Bay, Rte. 119-G, Rockaway Line, Hamilton Beach to Hammel, Queens Boro, NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. CD 6/8, under LB.

▲ **Hoffman & Elias**, 254 W. 31 St., New York 1, N. Y. CA $1,087,400. furnishing, installing D. C. connections and track bonding for Rockaway Line Liberty Ave. to Mott Ave. at Rockaway Park Queens Boro, NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn, N. Y. CD 6/14, under LB.

▲ **Horn Constr. Co., Inc.**, 2174 Hewlett Ave., Merrick, N. Y. CA $2,071,250 (3 bidders), rehabilitation timber deck tracks, contact rail, Liberty Ave. Line, incl. tracks for connection to Rockaway Line, Queens Boro, Contr. T-118, NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. CD 7/12, under LB:
Tully & DiNapoli, 127-50 Northern Blvd., Corona, N. Y. CA $1,547,565. (3 bidders), rehabilitation of tracks contact rail and incidental work from Linden Blvd. to Hamilton Beach Rockaway Line, Queens Boro, Contr. T-119. (New York).

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton,
Central Constr. Co., Inc., Clark, N. J., LB $799,191. (3 bidders) partial paving 8.706 mi. U. S. Route 22, Sections 4J and 9H, F-178 (12), Union and Somerset Counties. Bids July 21. CD 7/5.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,
Public Constructors, Inc., Pleasantville, N. J. LB $4,566,882, (6 bidders) grading, bridges, incl. paving 3.655 mi. Route 42, Sections 13 B and 14 A (North-South Freeway) from Browning to Lower Landing Rds. in Bellmawr and Runnemede F-193 (4), Camden and Gloucester Counties. Bids July 26. CD 7/5.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,
N. J.—Franklin Contg. Co., 12 Central Ave., Newark, N. J., LB $1,009,525 wid'n., dualization 1.236 mi. Route 4, Sections 5C and 4F, from West Saddle River Rd. to Route 17 U-197 (1), Fairlawn and Paramus, Bergen Co.;
N. J.—Johnson, Drake & Piper, Inc., 86 Trinity Pl., New York, N. Y., LB $2,416,737. dualization 2.708 mi. Route 17, Section 9 B, from Ramapo River to Franklin Turnpike, U-102 (7), Mahwah Twp. and Ramsey Boro, Bergen Co. Bids July 28. CD 7/5.

R. M. Luff Constr. Co., Willow Grove, Pa., CA $650,000 sewage treatment plant addn., ATLANTIC CITY, N. J. Atlantic City Sewerage Co., Guarantee Trust Bldg., Atlantic City, N. J. Bids July 5. CD 7/28, under LB.

† **Glasgow, Inc.**, 2625 Church Ave., Glenside, Pa., LB $332,903. roads, parking area and related drainage facilities, ENG-36-109-55-57, Mc Guire Air Force Base, WRIGHTSTOWN, N. J. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. Bids July 12. CD 6/29.

† **Willard, Inc.**, 2901 N. Broad St., Phila., Pa., LB $164,770. heating distr. sys., Mc Guire Air Force Base, ENG-36-109-55-94, WRIGHTSTOWN, N. J. U. S. Eng., 2635 Abbottsford Ave., Phila., Pa. American Hydrotherm Corp. and Adache & Case, 33-70 12 St., Long Island City, N. Y., engrs. CD 5/9/52.

Joseph Lombardi & Sons, 1311 S. Broad St., Phila., Pa. LB $242,007. sewers various locations. Bid 2422, PHILA., PA. Procurement Dpt., City Hall Annex, Phila., Pa. Samuel S. Baxter, water comr. CD 2/4/44; **Globe Contg. Co.**, Victory Ave., Upper Darby, Pa. LB $126,223. sewers Bid 2423; LB $78,939. sewers, Bid 2424, (Phila., Pa.).

Donaldson Paving Co., 20 Potomac Ave. S.W., Wash., D. C., LB $133,808, resurfacing (heater method) various roadways, WASH., D. C., D. C. Govt., Dpt. Hys., 499 Pa. Ave. N. W., Wash, D. C.

(Continued on page 122)

THE JOB: carve a modern expressway along the side of a steep gorge paralleling the Schuylkill River into Philadelphia. Keep tight control of all blasting. You're shooting right next to homes, factories, bridges, tunnels, power lines, and a railroad.

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*DFPA — Douglas Fir Plywood Association, Tacoma, Wash., is a non-profit industry organization devoted to product research, promotion and quality maintenance.

(Continued from page 120)

BUILDINGS—LB & CA

Vanity Fair Homes, c/o Henry A. Klar Realty Co., 220-02 Horace Harding Blvd., Bayside Hills, N. Y. Owner Builds. $600,000. 60 HOUSES on tract at Deer Park Ave. and Southern State Parkway, BABYLON, N. Y.

▲ **Caristo Constr. Corp.,** 26 Court St., Brooklyn 2, N. Y. CA $2,137,000. (9 bidders) general contract, JUNIOR HIGH SCHOOL 62, East 74 St. and Cortelyou Rd., BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. CD 7/18, under LB.

▲ **Caristo Constr. Corp.,** 26 Court St., Brooklyn 2, N. Y. CA $1,257,000. (9 bidders) general contract PUBLIC SCHOOL 272, Seaview Ave. and E. 102 St., BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. CD 7/18, under LB.

Sovereign Homes, Inc., 408 Avenue S, Brooklyn 23, N. Y. Owner Builds. $572,000. 56 HOUSES on East 55, 56 and 57 Sts. north of Fillmore Ave., BROOKLYN, N. Y. Dominick Salvati & Son, 26 Court St., Brooklyn, N. Y., archts.

▲ **Rural Estates,** c/o A. H. Salkowitz, archt., 87-25 Homelawn St., Jamaica 32, N. Y. Owner Builds. est. $1,875,000. 125 HOUSES on tract on Jericho Turnpike east of Larkfield Rd., COMMACK, N. Y.

▲ **Sanford Main Shopping Center, Inc.,** c/o Herbert Tannenbaum, archt., 205 E. 43 St., New York 17, N. Y. Owner Builds, $1,000,000. 2 story STORE and OFFICE Main St. and Sanford Ave., FLUSHING, N. Y. CD 6/28.

Elmwood Park Homes, c/o Tryion Realty Co., 18-89 Queens Blvd., Forest Hills, N. Y. Owner Builds. $700,000. 42 HOUSES on tract on Kernochan St., south of Hempstead Turnpike, HEMPSTEAD, N. Y.

▲ **Fountainvale Estates,** c/o Kern Realty Co., 124-26 Queens Blvd., Kew Gardens, N. Y. Owner Builds. CA est. $3,750,000. 250 HOUSES on tract at Pulaski Rd. east of Rte 110, HUNTINGTON, N. Y.

▲ **Castagna & Sons, Inc.,** 155-10 Jamaica Ave., Jamaica, N. Y. CA $3,901,026 (8 bidders) general contract for SHELTER for delinquent children (boys) 1221 Spofford Ave., Bronx Boro, NEW YORK, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. CD 7/5, under LB;
Martin Epstein Co., Inc., 227 Lewis Ave., Brooklyn 21, N. Y. CA $588,850. electrical work. (New York, N. Y.).

Margotta Constr. Co., Inc., 250 N. Washington St., Tarrytown, N. Y. CA $500,000. Bethany HOUSE addn., OSSINING, N. Y. Maryknoll Sisters, Pines Bridge Rd., Ossining, N. Y. Bids June 24. CD 6/22.

▲ **Irving Warfield,** c/o A. H. Salkowitz, archt., 87-25 Homelawn St., Jamaica 32, N. Y. Owner Builds. $1,000,000. 26 HOUSES on 14 acre tract on I.U. Willets Rd., west of Grand Central Parkway, ROSLYN PARK, N. Y.

Elmbrook Club Estates, c/o Pasford, Ltd., 37-01 Broadway, Fairlawn, N. J. Owner Builds, $600,000. 40 HOUSES on tract at Broad St., BLOOMFIELD, N. J.

Hopewell Homes, 80 E. Commerce St., Bridgeton, N. J., Separate Contracts. $350,000. RESIDENTIAL DEVELOPMENT, Beebe Run Rd., BRIDGETON, N. J.

Cinderella Homes, Inc., Att. Joseph Penny, 5 Haddon Ave., Haddonfield, N. J., Separate Contracts, $350,000. RESIDENTIAL DEVELOPMENT, Frosthoffer Ave., PENNSAUKEN, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

Penn Hills, Inc., Att. A. Steinberg, 503 Market St., Camden, N. J., Separate Contracts, $350,000. RESIDENTIAL DEVELOPMENT, Dove Rd., etc. PENNSAUKEN, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

Wiltshire Homes, Inc., 6301 N. Crittenden St., Phila., Pa. Separate Contracts. $350,000. RESIDENTIAL DEVELOPMENT, Wiltshire Rd., ARDMORE, PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

▲ **Goodman & Bell, Inc.,** 12 and Washington St., Allentown, Pa. CA $1,987,986. joint JUNIOR and SENIOR HIGH SCHOOL addn., parking lot, BOYERTOWN, PA. Boyertown Area Joint School Dist., Boyertown, Pa. CD 6/24, under LB.

▲ **Owner,** c/o A. A. Robinson, 14 W. Glenside Ave., Glenside, Pa. Separate Contracts. $1,250,000. RESIDENTIAL DEVELOPMENT, 50 units Rte. 202, CENTER SQUARE, PA.

Potteiger & Co., West Reading, Pa. CA $700,000. AUDITORIUM and LODGE, ELIZABETHTOWN, PA. Committee on Masonic Homes, Grand Lodge F & A M of Penna, Elizabethtown, Pa. Bids June 30. CD 6/29.

Savastio Constr. Co., Hershey, Pa. CA $558,755. Women's DORMITORY, ELIZABETHTOWN, PA. Elizabethtown, Pa. College, Elizabethtown, Pa. Bids July 15. CD 7/7.

▲ **Anthony J. Volpe,** 22 Shoemaker Lane, Bridgeport, Pa. Separate Contracts. $4,200,000. RESIDENTIAL DEVELOPMENT, 300 units Allendale Rd., GULPH MILLS, PA.

Pottsgrove Manor, Inc., Att. F. A. Collins, City Line and Belmont Ave., Bala Cynwyd, Pa. Separate Contracts. $350,000. RESIDENTIAL DEVELOPMENT, Bethlehem Pike, MONTGOMERYVILLE, PA.

Towne Investors Co., Inc., 701 Market St., National Bank Bldg., Phila., Pa. Separate Contracts. $350,000. BULLETIN BLDG. alterations, PHILA., PA. CD 3/21.

Nason & Cullen, 6522 Vine St., Phila., Pa. LB $413,984. 2 men's DORMITORIES, PHILA., PA. LaSalle College, 20 St. and Olney Ave., Phila., Pa. Bids July 19. CD 6/29.

D. Abbonizio & Sons, 6101 Noble St., Phila., Pa. Separate Contracts. $344,000. RESIDENTIAL DEVELOPMENT, Oak Hill Section, WEST CHESTER, PA.

Wallace Eng. & Constr. Co., Bryn Mawr, Pa., CA,

(Continued on next page)

$350,000. SUPERMARKET and parking area, WILMINGTON, DEL. American Stores Co., 434 N. 19 St., Phila., Pa.

SOUTH

HEAVY CONSTRUCTION—BA

† Louisiana—BA 8/17—U. S. Eng., foot of Prytania St., New Orleans, Low-Sill structure, Old River Control, Concordia Parish, Inv. No. 56-2. CD 6/26/46.

La., Jennings—BA 8/18—City, soil cement base with b. conc. wearing surf., necessary appurtenances on certain streets. Plans deposit $35, Barnard & Burk, 1023 Nicholson Dr., Baton Rouge, engrs.

▲† La., Alexandria—HYDRANT REFUELING—BA 8/25—U. S. Eng., P. O. Box 867, Little Rock, Ark., hydrant refueling 3 multi-outlet hydrants, pumphouse, fire hydrants, England Air Force Base, ENG-03-050-56-5. $1,000,000-$3,000,000.

† Florida—BA About 9/7—U. S. Eng., P. O. Box 4970 Jacksonville, Levee 6, Central and Southern Florida Flood control Proj. incl. about 11 mi. double levee with a single continuous borrow canal between, comprised of levee along the southeast side of the borrow canal and a lower levee along the northwest side with 3 culvert openings in south Palm Beach County, CIVENG-08-123-56-61. CD 11/24/43.

BUILDINGS—BA

▲ La., DeQuincy—CORRECTIONAL INSTITUTE—BA 8/23—State Bldg. Auth., State Capitol, Baton Rouge, Proj. 07-ICI correctional institute, $3,000,000. Plans deposit $200. Extended date. Dibolls-Kessels, 637 Pere Antoine Alley, New Orleans, archts. CD 6/21.

▲† Ky., Paducah—FEED PLANT—BA 9/30—Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash., D. C., feed plant, constr. in Bldgs. C-340, C-340-D, C-342, lighting, heating, ventilating, monorail, control wiring, etc., Inv. 151-55-59, Part of $8,500,000. Plans deposit $200, Giffels & Vallett, Inc., 1000 Marquette Bldg., Detroit, Mich., engrs.

BUILDINGS—LB & CA

Ky., Covington — RECTORY and SCHOOL — St. Agnes Chapel, Dixie Hy., soon lets contract 3 story, 60x174 ft., steel, rein.-con., school and rectory, $500,000. Betz & Bankemper, Scott St., archts. Beineke & Ruehlmann, 626 Broadway, Cincinnati, O., engrs. CD 4/25.

HEAVY CONSTRUCTION—LB & CA

† U. S. Eng., 308 Customhouse, Wilmington, N. C. cancelled bids to have been opened about Aug. 26, single cell engine test facility (Phase I) Seymour Johnson Air Force Base, ENG-31-075-56-7, GOLDSBORO, N. C. CD 7/25.

† R. J. Jones & Sons, 130 Wheelock St., Alexandria, La. LB $147,976, est. $163,944. 1 story, 10,150 sq. ft. masonry main PX bldg., England Air Force Base, ENG-03-050-55-138, ALEXANDRIA, LA. U. S. Eng., P. O. Box 867, Little Rock, Ark. Bids July 27. CD 7/1.

▲† Farnsworth & Chambers Co., Inc., Box 74, Houston, Tex. CA $1,228,437. squadron operations bldg., Lake Charles Air Force Base, ENG-41-243-55-67, LAKE CHARLES, LA. U. S. Eng., Box 1229, Galveston, Tex. CD 7/7, under LB.

† Globe Erection Co., Clarksville, Ind. CA $147,387, est. $120,860. gates on existing flood protection works at State Fairgrounds, Paddy's Run and Shawnee Park Plants, Louisville, Jefferson Co., ENG-15-029-55-14, KENTUCKY. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids July 20. CD 7/25.

BUILDINGS—LB & CA

Daniel Constr. Co., 429 N. Main St., Greenville, S. C., CA, $139,425. WAREHOUSE, GAINESVILLE, GA. Pacolet Mfg. Co. No. 6, Gainesville, Ga. Deering-Milliken Service Corp., Drayton, S. C., engrs.

▲ Hogan Bros., Inc., 236 Focies St., Metairie, La. LB $1,032,231. 2 story, steel, masonry 145,000 sq. ft. STORE in Gentilly Woods Subdivision, NEW ORLEANS, LA. Sears Roebuck & Co., Baronne and Commons Sts., New Orleans, La. Bids July 21. CD 7/15.

Tudo Constr. Co., Box 1232, Alexandria, La. LB $681,181. (7 bidders) Proj. No. 16-SCT-1, general HOSPITAL and infirmary, Louisana State Colony & Training School, PINEVILLE, LA. State Bldg. Auth., State Capitol, Baton Rouge, La. Bids July 26. CD 7/5.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

† O., Columbus—STORM DRAIN—BA 8/16—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., storm drain at Lockbourne Air Force Base, ENG-46-022-56-4. CD 7/20.

O., Lima—BA 8/24—State Dpt. Mental Hygiene, 220 S. Parsons St., Columbus, drilling wells at Lima State Hospital.

† Idaho—BA 9/7—Bureau Reclamation, Dpt. Interior, Boise, face rehabilitation Black Canyon Dam, Boise Proj. near Emmett, Gem Co., Spec. DC 4484; adv. ENR 8/4. CD 9/14/44.

BUILDINGS—BA

▲ Ill., Centralia—HOSPITAL, etc.—BA 8/25—St. Mary's Hospital, Centralia, 1-2-and 3-and 4 story, 100-bed hospital chapel, nurses home, boiler house, etc. $2,500,000. Extended date. Maguola & Quick, 4908 Delmar Blvd., St. Louis 8, Mo., archts. CD 7/1.

(Continued on page 125)

(*Advertisement*)

THE IMMENSITY of the Los Angeles County Sewer system project is accentuated by comparison of workmen with 144 inch diameter concrete pipe.

Vibration Important Feature in Production of 144 Inch Concrete Pipe

• **Los Angeles installation**—The expansion of facilities of the County Sanitation Districts of Los Angeles necessitated installation of 7800 feet of 12 foot diameter reinforced concrete pipe. The pipe is 12 feet in length with tongue and groove joints and with a shell thickness of 12 inches. The pipe sections weigh about 39 tons per length.

• **Manufactured at plant**—Reinforcing consisted of a double cage, one of which was elliptical in shape. Cages were manufactured at the plant site and the circumferential reinforcement welded to the longitudinal bars. The cages were dropped over the inner form and held in place by appropriate spars. The outer form was then placed, and the job was poured in the usual manner.

• **Tests made**—United Concrete Pipe Corporation used three Model PX Vibrators on steel forms specially constructed to eliminate leakage of grout or water. Tests made of concrete in these pipes show high strengths, as much as 7000 pounds per square inch not being uncommon.

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FREQUENCY STABILITY & SELECTIVITY guaranteed for life!

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GENERAL ELECTRIC

(Continued from page 123)

Wis., Milwaukee—WAREHOUSE, etc.—Bids Asked—Westinghouse Electric Supply Co., 546 N. Broadway, 30,000 sq. ft., warehouse and office, $275,000. CD 1/5.

HEAVY CONSTRUCTION—LB & CA

▲ OHIO—State Hy. Dpt., Columbus, Zone 15, John F. Beasley Constr. Co., 20 Wacker Dr., Chicago, Ill. CA $8,132,000. nine-span steel truss bridge over Cuyahoga River at Cleveland, Cuyahoga Co. CD 7/20, under Streets and Roads.

OHIO—State Hy. Dpt., Columbus, Zone 15, rejected bids July 12, Type T-35 and structures 4.66 mi. SR 18-(.44-6.70), Medina Co. LB $548,767. CD 7/20, under LB.

S. A. Ruebel & Co., 800 Ross St., Bernard, O. CA $537,330, est. $648,165. combination sanitary trunk sewers (second section) in Finneytown, CINCINNATI, O. Bd. Comrs. Hamilton Co., Court House, Cincinnati, O. Bids July 19, awarded July 26. CD 7/25, under LB.

▲† U. S. Eng., P. O. Box 59, Louisville 1, Ky. cancelled bids to have been opened Aug. 10, headquarters command ARD, Wright Patterson Air Force Base, DAYTON, O. $5,000,000. Will re-advertise. CD 7/12.

Schirmer-Peterson Co., 6830 Beaver Ave., Cleveland 4, O. LB. $445,213. 2 pumping stations, some minor sewer constr., Hilltop Sewer Projs. Eastern Suburbs, CLEVELAND, O. Cuyahoga Co., County Court House, Cleveland 13, O. John H. Puzenski, county sanitary engr. CD 7/12/54;

Haddad Constr. Co., Box 903, Hilltop Station, Columbus, O. LB $308,560. sewer trunk line along Wilson Mills Rd. and Monticello Blvd. to Lander Rd. (Cleveland, O.).

B. Fatol Constr. Co., 3553 E. 103 St., Cleveland 5, O. LB $278,506. trunk line from Lander to Beachill Rd. along Wilson Mills Rd., (Cleveland, O.).

▲ INDIANA—Indiana Toll Road Comn., 309 W. Washington St., Indianapolis, Zone 4, H. G. Christman Constr. Co., Inc., 850 Fellow St., South Bend, Ind., LB $2,217,604. toll plazas and roadway lighting systems in 5 interchanges and western terminal on Northern Indiana East-West Toll Road. Bids July 27. CD 4/28.

Lakeside Bridge & Steel Co., 5300 N. 33 St., Milwaukee, Wis., LB, $222,718. reconstr., widening north bascule bridge of 6 St. Viaduct, MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids July 26. CD 7/12.

Bender & Heystek, 3520 Bay Rd., Saginaw, Mich. LB $786,405. (5 bidders) Sect. 1, 40, 96 ft., Sect. 2, 77,476 ft. sanitary sewers, CARROLLTON, MICH. Carrollton Twp., Stephen J. LaTarte, clk., Carrollton, Mich. Bids June 28. CD 6/22.

BUILDINGS—LB & CA

Knowlton Constr. Co., Bellefontaine, O. LB. $965,200. general contract. 4 story, brick, stone, STUDENT UNION BLDG. at Bowling Green State University, BOWLING GREEN, O. State Dpt. P. Wks., 705 Ohio Dpts. Bldg., Columbus, O. Bids July 26. CD 6/22.

Herman Stein, Milan, O. CA Est. $350,000. 19 ranch HOMES in Milan Twp. off Rte. 113 south on Edison Dr., section known as Seminary Acres, MILAN, O. Joseph Auerbach, Sandusky, O.

Marion Constr. Co., 7210 E. 33rd St., Indianapolis, Ind. Owner Builds. $600,000, 40 HOMES in third section of Shadeland, INDIANAPOLIS, IND.

▲ Arlington Heights, Inc., 2nd and Arlington Ave., Indianapolis, Ind. Owner Builds. $4,000,000, 300 HOMES, Arlington Heights between 38th and 42nd Sts., INDIANAPOLIS, IND.

▲ Maple Heights Constr. Co., 820 E. 64th St., Indianapolis, Ind. Owner Builds, $3,500,000, 200 HOMES in Maple Heights addn., INDIANAPOLIS, IND.

Wallace Skinner Realty Co., 345 9 W. 12th St., Indianapolis, Ind. Owner Builds. $850,000. 45 HOMES in Fair Meadows addn., INDIANAPOLIS, IND.

Oaklandon Homes Inc., c/o The Glossbrenner Co., Oaklandon, Ind. Owner Builds, $500,000, group of HOMES in Oaklandon addn. Northeast, OAKLANDON, IND.

Wayne W. Whiffing, 5425 North Bosart Ave., Indianapolis, Ind. Owner Builds, $800,000, fifty HOMES, Oakland Village South edge of OAKLANDON, IND.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

† North Dakota—BA 8/25—U. S. Eng., Riverdale, pavement and guard rail, Garrison Dam and Reservoir, CIVENG-32-015-56-3. Extended date. CD 7/25.

† Texas—BA 8/25—U. S. Eng., 100 West Vickery St., Fort Worth, water supply system, Garza-Little Elm Dam and Reservoir, Elm Fork of Trinity River, CIVENG-41-443-56-2. CD 8/13/53.

Neb., Omaha—BA 8/29—Improvement Dist. No. 2, 7017 Lafayette St., paving near here. $168,397. Extended date. Henningson, Durham & Richardson, 2962 Harney St., engrs. CD 7/7.

† Wyoming—SUB-STATION—BA 9/7—Bureau Reclamation, Dpt. Interior, Glendo, Casper Sub-station addns., Kendrick Proj., near Casper, Spec. DC 4451; adv. ENR 8/4.

BUILDINGS—BA

Minn., Bloomington (P. O. Minneapolis)—SCHOOL—BA 8/30—Bd. Educ., A. Moir, clk., 10025 Penn Ave. S., Minneapolis, Zone 20, grade school, $900,000. Plans deposit $25. E. D. Corwin & Assoc., E. 818 First National Bank Bldg., St. Paul, archts. CD 7/27.

(Continued on next page)

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TRU-LAY *Flexible* PUSH-PULLS

are Dependable and Accurate even under the most adverse conditions. They perform effectively under extremes of Heat or Cold . . . from jet engine temperatures to 70° below F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls means the virtual Elimination of Maintenance.

Widely Used on Construction Equipment

Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on Tractors and their accessories, Power Shovels, Winches, Road Graders, Road Oilers, Dump Trucks, Snow Plows, Engine-driven Pumps, Rock Crushers, etc.

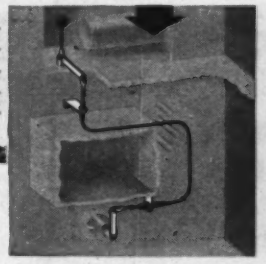
On Construction Equipment these dependable Push-Pulls are used for the remote control of Hydraulic and Air Valves, Brakes, Clutches, Transmissions, Throttles, Chokes, Governors, Power Take-Offs, and on many other applications.

TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances, up to 150 feet or more.

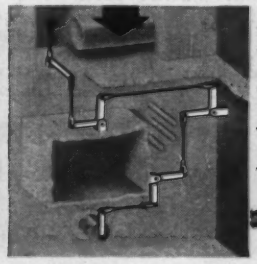
Advantages of TRU-LAY PUSH-PULL flexibility and simplicity are pictured below:

TRU-LAY PUSH-PULL

Simple
One Moving Part
Life-Time Service
Life-Time Accuracy
Low over-all Cost
Noiseless



MECHANICAL LINKAGES



Complex
Many Parts
Many Points of Wear
Increasing Back-Lash
Loss of Accuracy
Vibration
Rattles

"Solid as a rod but *Flexible* as a wire rope" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions as shown in the picture at the left . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, Accurate, Adaptable, Rugged . . . they are the ideal remote controls for Construction Equipment.

Our DATA FILE will answer your further questions
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AMERICAN CHAIN & CABLE

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Universal Joints

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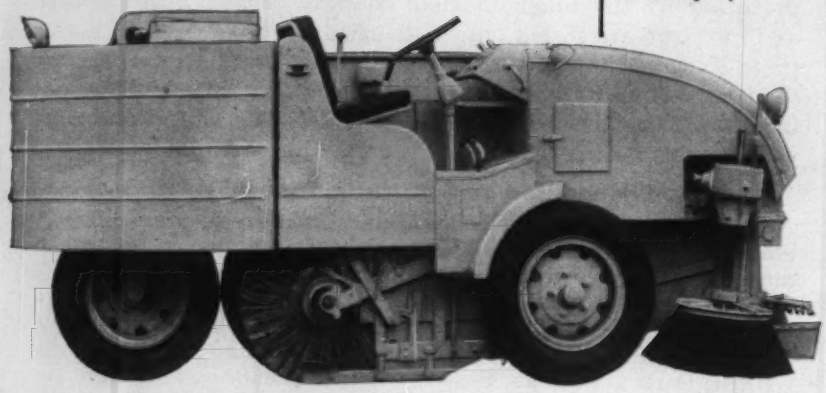
Allis-Chalmers Mfg. Co.
Austin-Western Co.
Barber-Greene Co.
Braden Winch Co.
Brooks Equipment Company
Caterpillar Tractor Company
Elgin Sweeper Co.
E. D. Etnyre & Co.
The Galion Iron Works & Mfg Co.
Koehring Co.
Frank G. Hough Company



A number of Blood Brothers Universals are used on this Municipal Supply Co. Street Sweeper.

The Jaeger Machine Co.
Huber-Warco Co.
Meili-Blumberg Corp.
Municipal Supply Company
Tulsa Winch Division of Vickers, Inc.
Seaman Motors

These "big name" equipment builders strive constantly to give you equipment that's faster, more efficient—and more dependable too!

For instance, to help protect your profits against delays and repair bills, they all provide extra-rugged, dependable Blood Brothers Universal Joints.

Used on many moving parts—from hand controls to heavy-duty drive lines—Blood Brothers Universals take a power-packed beating. Their acceptance by the "big names" above is strong evidence that they stand up and deliver—through years of grueling service.

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BLOOD BROTHERS MACHINE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
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"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.
MANUFACTURERS OF THE "CEMENT GUN"

▲ **Minn., Roseville** (P. O. Box St. Paul)—SCHOOL—BA 9/1—Bd. Educ., Independent School Dist. No. 3, T. C. Schultz, clk., junior high school incl. elevator, water well and pump, $1,540,000. Plans deposit $25. Magney, Tusler & Setter, 303 Roanoke Bldg., Minneapolis, archts. CD 2/14.

BUILDINGS—SLC

▲ **Neb., Omaha**—OFFICE BLDG.—World Publishing Co., 14 and Dodge Sts., soon lets contract doctor's office bldg., 44 and Farnam Sts. $2,000,000. John Latenser & Sons, 1307 Farnam St., archts. CD 10/15/54.

HEAVY CONSTRUCTION—LB & CA

Orfei & Mariani, 1156 Homer St., St. Paul, Minn. LB $170,908. furnish, install sanitary lateral sewers, storm sewers, water main, Wood Hill addition, EDINA, MINN. Village Gretchen S. Alden, clk., Edina, Minn. Bids July 25, CD 7/11;
LB $97,332. sanitary sewer imprv. Nos. 85 and 86; constr. water imprvs. Nos. 88, 90 and 91, (Edina, Minn.).

Sandstrom & Hafner, 640 E. Superior St., Duluth, Minn. LB $297,712. (5 bidders) furnish, install water and sewer imprvs., FRIDLEY, MINN. Village, E. Madsen, village mgr., Fridley, Minn. Bids July 28. CD 7/14.

SOUTH DAKOTA—State Hy. Dpt., Pierre,
Lawrence Steele & Son, Belle Fourche, S. D. LB $123,663. one 197 ft. 6 in. composite I-beam viaduct and 9 rein.-con. box culverts, S 64 (9), Butte and Meade Counties. Bids July 26. CD 7/15.

† **Pine Bluff Sand & Gravel Co.**, foot of Nebraska St., Pine Bluff, Ark. CA $448,850, est. $453,395. constr, repair pile dikes and revetment about 2 mi. upstream from White Cloud, Kan., Rulo to Tarkio, Mo., MISSOURI AND KANSAS. U. S. Eng., Federal Office Bldg., Kansas City, Mo. (Correction-cost). CD 7/20, under LB.

▲ **SOUTH DAKOTA**—State Hy. Dpt., Pierre,
S. D.—**Missouri Basin Constr. Co.**, Mitchell, S. D. LB $474,650. (8 bidders) part base course, bit. surf. and part c. conc. 2.897 mi., U 530 (1), Hughes Co.;
S. D.—**Dave Gustafson & Co., Inc.**, 502 E. 6 St., Sioux Falls, S. D. LB $458,024. (7 bidders) grading, subbase 16.394 mi., S 64 (9), Butte and Meade Counties:
S. D.—**Northwestern Engineering Co.**, 1311 St. Joe St., Rapid City, S. D. LB $88,439. (4 bidders) grading 4.079 mi. S 631 (1), Lawrence Co.;
S. D.—**A. W. Schnuerle**, Box 101, Aberdeen, S. D. LB $103,870. base course, blotter type bit. surf. 12.965 mi. S 19 (2), S 311 (8), S 320 (7), Brown Co.;
S. D.—**Summit Constr. Co.**, P. O. Box 1609, Rapid City, S. D. LB $277,898. (6 bidders) base course imprv., bit. surf. 11.789 mi. F 237 (14), Todd and Tripp Counties; LB $75,062. (3 bidders) grav. surf. 2.718 mi. S 132 (3), Pennington Co.; LB $347,161. (8 bidders) base course imprv., bit. surf. 18.228 mi. F 237 (15), Todd Co.;
S. D.—**G. H. Lindekugel & Sons**, Mitchell, S. D. LB $286,889. (8 bidders) base course, bit. surf. 14.739 mi., SAP 305, Charles Mix and Douglas Counties;
S. D.—**C. H. Lien Constr. Co.**, Box 1807, Rapid City S. D. LB $160,269. (8 bidders) base course, bit. surf. blotter on spur 11.678 mi, SAP 304, Deuel Co. Bids July 26. CD 7/15.

† **Cunningham Kiewit Co.**, 4229 Lafayette St., Omaha, Neb., CA $806,966, constr. and repair standard dikes and revetment, Missouri River, Upper Calhoun-Upper Rockford Bends, Inv. 25-066-55-155, near Fort Calhoun, NEBRASKA. U. S. Eng., 1709 Jackson St., Omaha, Neb. CD 7/21.

▲ **KANSAS**—Kansas Turnpike Auth., P. O. Box 681, Topeka,
KTA—**Broce Constr Co., Inc.**, Dodge City, Kan. LB $2,629,211. b. conc. 13.8 mi., Lyon Co.;
KTA—**J. B. Michael Co., Inc.**, P. O. Box 5895, Memphis, Tenn. LB $1,477,218. b. conc. 7.11 mi., Lyon Co. LB $1,750,516. b. conc. 9.55 mi., Lyon, Osage and Waubaunsee Counties;
KTA—**Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Iowa. LB $1,551,016. c. conc. 8.07 mi., Douglas Co. Bids July 29. CD 7/15.

KANSAS—State Hy. Comn., Chanute,
Freeto Constr. Co., Inc., Pittsburg, Kan. CA $102,471. (3 bidders) dense graded surf. detour surf. 3.371 mi., Proj. 16-11 F 018-6 (4), Cherokee Co. Bids July 21. CD 7/7.

KANSAS—State Hy. Comn., Norton,
W. A. Biba Eng. Co., Geneva, Neb. CA $118,450. (11 bidders) grading 7.998 mi. and 8.059 mi. Proj. 24-91 IN 01-1 (1) and (5), Sherman Co. Bids July 7. CD 6/24.

KANSAS—State Hy. Comn., Topeka,
Kaw Paving Co., Inc., P. O. Box 329, Topeka, Kan. CA $126,442. Bridge 40-89-4.8, Sta. 55 plus 68, 73 ft., 92 ft., 73 ft., steel girder; Bridge 40-89-5.0 Sta. 67 plus 09, 28x14x47 ft. rein.-conc.; Bridge 40-89-5.4 Sta. 89 plus 77, 45 ft., 63 ft., 45 ft. rigid frame, Proj. 40-89 IN 01-5 (16), Shawnee Co. Bids July 14. CD 7/1, under Streets and Roads.

KANSAS—State Hy. Comn., Topeka,
Kan.—**Douglas Bros., Inc.**, 510 E. 15 St., Topeka, Kan. CA $73,290. (8 bidders) pavement patching, sheet asph. surf. course 3.283 mi. Proj. 75-70 K 1208 (2); sheet asph. surf. course 0.385 mi. Proj. 75-70 K 1209 (2), Osage Co.;
Kan.—**Independent Constr. Co.**, Overland Park, Kan. CA $138,714. (5 bidders) sheet asph. surf. course 10.891 mi. Proj. 59-23 K 1227 (2), Douglas Co.;
Kan—**W. H. Bill Bennett Constr. Co.**, 1310 State St., Kansas City, Kan. CA $181,487. (7 bidders) grading 2.275 mi. Proj. 40-89 IN 01-5 (16), Shawnee Co. Grand total $393,491. Bids July 14. CD 7/1.

(Continued on page 128)

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(Continued from page 126)

Quisle Constr. Co., 4119 T & P Pass Bldg., Fort Worth, Tex. CA $122,000. freight and passenger DEPOTS at Denron and White Rock, TEXAS, Gulf, Colorado & Santa Fe Ry. Co., W. T. Donoho, ch. engr., Galveston, Tex.

Colorado Valley Telephone Co-operative, Inc., LaGrange, Tex., Own Forces. $78,000. 85 mi. rural pole telephone lines, Lagrange, TEXAS. CD 12/8.

Mischer-Harris Constr. Co., 6925 Navigation Blvd., Houston, Tex., CA $50,000. c.i. water lines, facilities, outside limits of HOUSTON, TEX. Lewis O. Tyra & Assocs., 5519 Lawndale St., Houston, Tex. Tom Heaney, 2113 State St., Houston, Tex. engr.

W. R. King Bldg. Corp., 4027 Underwood St., Houston, Tex., CA $75,000. storm sewers, CA $78,200. sanitary sewer collection lines, HOUSTON, TEX. Buck King & Assocs., 4027 Underwood St., Houston, Tex. Matt Howard Jr. & Assocs., 1012 LeHall St., Houston, Tex., archts. CD 5/31.

W. R. King Bldg. Corp., 4027 Underwood St., Houston, Tex., CA $46,116. earthwork, grading, HOUSTON, TEX. Buck King & Assocs., 4027 Underwood St. Houston, Tex. Matt Howard Jr. & Assocs., 1012 LeHall St., Houston, Tex., archts.

W. R. King Bldg. Corp., 4027 Underwood St., Houston, Tex., CA $80,000. constr., c. conc. paving new streets, concrete curbs, gutters, HOUSTON, TEX. Buck King & Assocs., 4027 Underwood St., Houston, Tex. Matt Howard Jr. & Assocs., 1012 LeHall St., Houston, Tex., archts.

Mischer-Harris Constr. Co., 6925 Navigation Blvd., Houston, Tex., CA $100,000; unit of street concrete paving, concrete curbs, gutters, outside limits of HOUSTON, TEX. Lewis O. Tyra & Assocs. 5519 Lawndale St., Houston, Tex. Tom Heaney, 2113 State St., Houston, Tex. engr.

Mischer-Harris Constr. Co., 6925 Navigation Blvd., Houston, Tex., CA $75,000. unit of sanitary sewers; $80,000, unit of storm sewers, outside limits of HOUSTON, TEX. Lewis O. Tyra & Assocs., 5519 Lawndale St., Houston, Tex. Tom Heaney, 2113 State St., Houston, Tex. engr. CD 6/2.

Mischer-Harris Constr. Co., 6925 Navigation Blvd. Houston, Tex., CA $46,116. earthwork, grading in bldg. area, outside limits of HOUSTON, TEX. Lewis O. Tyra & Assocs., 5519 Lawndale St., Houston, Tex. Tom Heaney, 2113 State St., Houston, Tex., engr.

W. R. King Bldg. Corp., 4027 Underwood St., Houston, Tex., CA $47,218. water lines, facilities, HOUSTON, TEX. Buck King & Assocs., 4027 Underwood St., Houston, Tex. Matt Howard Jr. & Assocs., 1012 LeHall St., Houston, Tex., archts.

Farnsworth & Chambers Co., Inc., Box 74, Houston, Tex., CA $45,600. bldg. site area general earthwork, grading, Outside city limits, HOUSTON, TEX. Frank W. Sharp, 6302 Bellaire Blvd., Houston, Tex.

Farnsworth & Chambers Co. Inc., Box 74, Houston, Tex., CA $77,500. asphalt-paved streets, concrete curbs, gutters, outside city limits, HOUSTON, TEX. Frank W. Sharp, 6302 Bellaire St., Houston, Tex.

Mischer-Harris Constr. Co., 6925 Navigation Blvd., Houston, Tex., CA $75,000. natural gas lines, outside city limits of HOUSTON, TEX. Lewis O. Tyra & Assocs., 5519 Lawndale St., Houston, Tex. Tom Heaney, 2113 State St., Houston, Tex., engr.

W. R. King Bldg. Corp., 4027 Underwood St., Houston, Tex., CA $75,000. natural gas distr. lines, HOUSTON, TEX. Buck King & Assocs., 4027 Underwood St., Houston, Tex. Matt Howard Jr. & Assocs., 1012 LeHall St., Houston, Tex., archts.

Farnsworth & Chambers Co., Inc., Box 74, Houston, Tex. CA $49,000. c.i. water lines outside city limits HOUSTON, TEX. Frank W. Sharp., 6302 Bellaire Blvd., Houston, Tex.

Farnsworth & Chambers Co., Inc., Box 74, Houston, Tex., CA $77,500. sanitary sewers; CA $76,500 storm sewers, outside city limits HOUSTON, TEX. Frank W. Sharp, 6302 Bellaire Blvd., Houston, Tex.

Lancaster Building Co., c/o owner, CA, $89,190 sanitary and storm sewer lines, water lines, some asph. paving, LANCASTER, TEX. Lancaster Terrace Development Co., Lancaster, Tex.

Liberty County, c/o Comrs. Court, Liberty, Tex. Own Forces, $75,000 Prec. 2, road repairing; $85,000 Prec. 3, road repairing, imprvs.; $90,000 Prec. 3, road repairing, imprvs., LIBERTY, TEX. Grand total $250,000. CD 12/3.

Colglazier & Hoff, 326 Seguin Rd., San Antonio, Tex., CA, $49,195. c.i. water mains, distr. sys., SAN ANTONIO, TEX. N. O. Simmons Bldg. Co., Box 5291, Beacon Hill Sta., San Antonio, Tex.

Colglazier & Hoff, 326 Seguin Rd., San Antonio, Tex., CA, $76,000. asphalt-paved streets, curbs, gutters, SAN ANTONIO, TEX. N. O. Simmons Building Co., Box 5291, Beacon Hill Sta., San Antonio, Tex.

Colglazier & Hoff, 326 Seguin Rd., San Antonio, Tex., CA, $75,000. natural gas lines, SAN ANTONIO, TEX. N. O. Simmons Bldg., Box 5291, Beacon Hill Sta., San Antonio, Tex.

Colglazier & Hoff, 326 Seguin Rd., San Antonio, Tex., CA, $75,000. storm sewers; $76,900 sanitary sewers, SAN ANTONIO, TEX. N. O. Simmons Bldg. Co., Box 5291, Beacon Hill Sta., San Antonio, Tex. CD 7/8.

Colglazier & Hoff, 326 Seguin Rd., San Antonio, Tex., CA, $47,117, bldg. site area earthwork, grading, SAN ANTONIO, TEX. N. O. Simmons Building Co., Box 5291, Beacon Hill Sta., San Antonio, Tex.

(Continued on next page)

† **WYOMING**—Bureau P. Rds., Dpt. Commerce, Bldg. 40, Denver Federal Center, Denver, Colo.,
L. H. Weber, Rawlins, Wyo., CA, $96,588, est. $91,018 1.327 mi. Forest Hy. Proj. 6-E, Snake River Canyon and State Proj. 3978, Alpine, Lincoln Co. Bids July 21, awarded July 22.

Burkhardt Steel Co., 869 S. Broadway, Denver, Colo., CA, $290,553, total est. $440,000. steel for stadium addn., BOULDER, COLO. University of Colorado, Campus, Boulder, Colo. Awarded July 19. CD 6/20.

Foutz & Bursum Constr. Co., 706 N. Dustin St., Farmington, N. M., CA, $230,453, water sys. imprvs., incl. 88,000 ft. water pipe line, GRAND JUNCTION, COLO. City Court House, Grand Junction, Colo. Bids July 20, awarded July 21. CD 7/11.

L. J. Hesser, P. O. Box 806, Greeley, Colo., CA, $81,952 street imprvs., STERLING, COLO. Logan Co., City Hall, Sterling, Colo. Bids July 18, awarded July 22. Harold Hoskins & Assocs., 725 9 St., Greeley Colo., engrs.

BUILDINGS—LB & CA

G. W. Madsen Constr. Co., 4916 E. Sunnyslope Rd., Minneapolis, Minn. LB $515,500. (8 bidders) general contract, SCHOOL addn., ARLINGTON, MINN. Bd. Educ., O. H. Meyer, clk., Arlington, Minn. Bids July 27. CD 6/30.

▲† **W. W. Bennett Constr. Co.**, 3252 Roanoke Rd., Kansas City, Mo. LB $1,084,491. est. $1,064,131. (4 bidders) two 3 story concrete, masonry block enlisted men's BARRACKS; LB $109,206. est. $97,278. motor pool facilities incl. concrete block repair shop, gas station, gas dispensing facility, FORT CROWDER, MO. U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. Bids July 28. CD 7/22.

The Austin Co., 1198 Arcade Bldg., 812 Olive St., St. Louis 1, Mo., CA Est. $350,000. design and construct 2 story, bsmnt., 92x150 ft., concrete blocks, rein.-con. OFFICE, 1 story, 24x83 ft. GARAGE, 3750-60 Lindell Blvd., ST. LOUIS, MO. General America Corp., 707 Market St., St. Louis 1, Mo. and General Insurance Co. of America, lessee, W. L. Campbell, pres., 4347 Brooklyn Ave., Seattle 5, Wash. CD 12/14.

Lammers Realty & Constr. Co., Inc., E. W. Lammers, pres., 47 Willmore Rd., Affton 23, Mo. Owner Builds. $360,000. 24 RESIDENCES in Larkin Acres subdivision, on Concord Rd. between Von Taige Rd. and Lindbergh Blvd. in Concord Village area, ST. LOUIS COUNTY, MO.

C. Rallo Contg. Co., 5000 Kemper Ave., St. Louis 9, Mo. CA $493,822. general contract 3 story, brick, masonry, 50,000 sq. ft. NOVITATE, incl. dormitory chapel, classrooms, library, etc., Vance Rd., VALLEY PARK, MO. Foreign Mission Sisters of St. Dominic, Vance Rd., Valley Park, Mo. and c/o Archdiocesan Bldg. Comn., Rev. James R. Hartnett, exec. secy., 3810 Lindell Blvd., St. Louis 8, Mo. Bids July 22. CD 7/5.

Sioux Falls Constr. Co., 800 S. 7 St., Sioux Falls, S. D., CA, $800,604, general contract McKennan HOSPITAL addn., SIOUX FALLS, S. D. Presentation Sisters, Aberdeen, S. D. Bids June 17. Harold Spitznagel & Assocs., 1800 S. Summit St., Sioux Falls, archts. Hills, Gilbertson & Hayes, 6009 Wayzata Blvd., Minneapolis, Minn., consult. archts.

W. Boyd Jones, 111 S. 40 St., Omaha, Neb., CA $129,850 SHOP and service bldg., VALLEY, NEB. Omaha Public Power Dist., 17 and Harney Sts., Omaha, Neb. Bids July 26. CD 6/8.

† **Dickman-Pickens-Bord**, Muskogee, Okla., LB $497,575, addn to VETERANS ADMIN. BLDG., MUSKOGEE, OKLA. Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C. CD 4/28.

▲ **Yarbrough Constr. Co.**, Box 851, Austin, Tex., CA $2,375,440, BUILDINGS for State School for the Deaf, AUSTIN, TEX. State Bd. Control, Capitol Station, Austin, Tex. Bids July 14. CD 7/20 under LB.

Anderson Constr. Co., 445 14 St., Beaumont, Tex. Owner Builds. $350,126. DWELLINGS, BEAUMONT, TEX. CD 2/25.

Lee-Emmert, 7602 N. Central Expressway, Dallas, Tex., LB, $391,000. WAREHOUSE, SHOP and STORAGE BLDG. UNITS, DALLAS, TEX. State Highway Dpt., Austin, Tex. Bids July 20.

Cuff Constr. Co., Denison, Tex., CA, $365,000. (D) 33 DWELLINGS, DENISON, TEX. J. A. Cuff, Denison, Tex. CD 2/25.

Sam Guido Jr. & Assocs., Caples Bldg., El Paso, Tex., Owner Builds, $345,000. Job 8, 25 DWELLINGS: $375,000, Job 9, 38 DWELLINGS, EL PASO, TEX. CD 3/24.

C. Grady Cates, Builder, 9747 H. Hines Blvd., Dallas, Tex., CA, $375,000. Group 7, 39 DWELLINGS, FARMERS BRANCH, TEX. C. Grady Cates, Jr., 9747 H. Hines Blvd., Dallas, Tex. CD 12/13.

▲ **W. R. King Bldg. Corp.**, 4027 Underwood St., Houston, Tex., CA, $409,610 Unit No. 1, 43 DWELLINGS: CA $371,000 Unit 11, 31 DWELLINGS; CA $373,135 Unit 12, 38 DWELLINGS, HOUSTON, TEX. Grand total $1,153,745. Buck King & Assocs., 4027 Underwood St., Houston, Tex. CD 4/8.

▲ **Perrin White Lumber Co.**, 3634 Durness St., Houston, Tex., CA, $367,100. (A) 28 DWELLINGS; CA $389,190 (B) 30 DWELLINGS; $395,000. (D) 36 DWELLINGS, HOUSTON, TEX. Perrin, White & Assocs., 3634 Durness St., Houston, Tex. Grand total $1,151,290. CD 5/24.

Lancaster Building Co., c/o owner, CA, $385,000. SHOPPING CENTER, LANCASTER, TEX. Lancaster Terrace Development Co., Lancaster, Tex. CD 3/21.

West Texas Builders, Box 5035, Lubbock, Tex. CA, $428,000. SHOPPING CENTER, LUBBOCK, TEX. Development Co., P. Johnson or G. C. Harston, 3601 28 St., Lubbock, Tex. CD 7/20.

(Continued on next page)

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TEXAS DIVISION

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Interior . . . showing Bell's rotor assembly.

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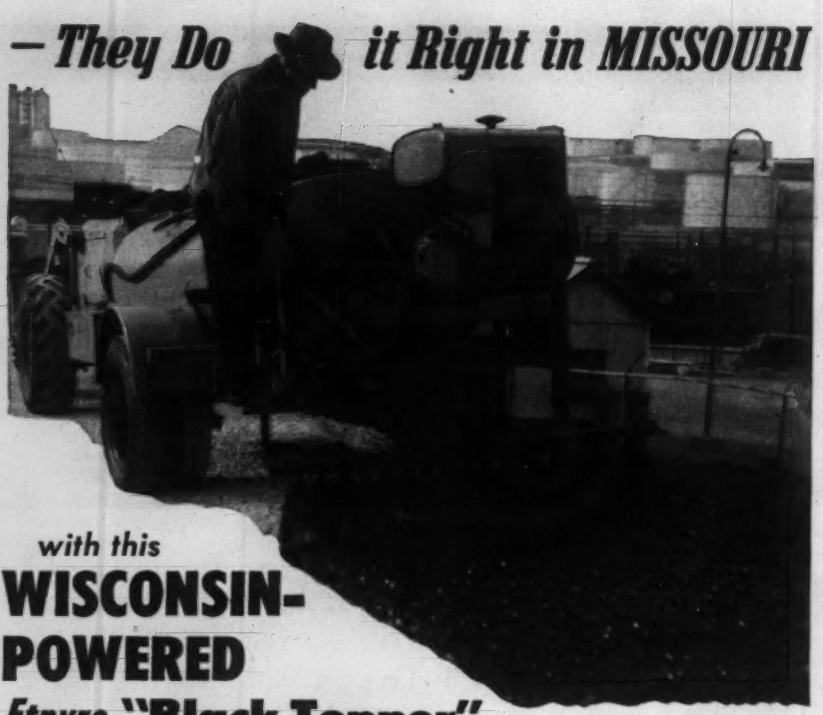

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Etnyre "Black Topper"

Down in Jackson County, Missouri, this Etnyre "Black Topper" made by E. D. Etnyre & Co., Oregon, Ill., provides fast, efficient service on highway maintenance and construction jobs.

This equipment will spray from 1/10 to 3 gals. per sq. yd. with bars up to 12 ft. long, and will operate at road speeds up to 1500 feet per minute . . . made possible by lowest possible center of gravity.

Ruggedly built for heavy-duty service, an equally rugged Wisconsin Heavy-Duty Air-Cooled Engine was the logical choice of the builder. The unit illustrated above is operated by a Model VE4 Wisconsin Power Unit, delivering 17 B.H.P. at 1800 rpm., which is recommended for this equipment, although the VE4 power range has a top of 21.5 hp. at 2400 rpm.

Self-cleaning, file-hard roller bearings at BOTH ends of the crankshaft take up all radial and end thrusts, providing the greatest possible protection against bearing failure and assuring smooth running. Exceptionally efficient, foolproof AIR-COOLING provides dependable operation at all temperatures from sub-zero to 140° F.

All Wisconsin Air-Cooled Engines (3 to 36 hp.) are of heavy-duty design and construction in all details . . . built for long engine life and lowest cost maintenance. *You* can't do better than to specify "Wisconsin Engine Power" for *your* equipment.

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N. O. Simmons Bldg. Co., Box 5291, Beacon Hill Sta., San Antonio, Tex., Own Forces, $365,000; 30 DWELLINGS: $350,000. 32 DWELLINGS, SAN ANTONIO, TEX. CD 7/8.

▲† C. H. Leavell & Co., Box 1451, El Paso, Tex. CA $1,962,028. radiochemistry LABORATORY, Eng. 291-55-8, LOS ALAMOS, N. M. U. S. Govt. Atomic Energy Comn., Los Alamos, N. M. CD 7/27, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

† Washington—MILITARY INSTALLATION—BA 8/19—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 3 masonry BOQ and barracks, bit. roads, parking areas, concrete walks, hardstands for military installation, Redmond, ENG-45-106-56-9. Plans deposit $100. Extended date. CD 7/19.

Calif., San Diego—BA 8/24—City, 1600 Pacific Hy., Moore Street Storm Drain. $785,000. Plans deposit $10. CD 11/7/52.

BUILDINGS—BA

Wash., Spokane—SCHOOL—BA 8/23—Trent School Dist. No. 118, Irwin St., elementary school, Adams and Wellesley Sts. $450,000. G. M. Rasque Sons, Wash. Trust Bldg., archts. CD 11/10.

HEAVY CONSTRUCTION—LB & CA

M. Morrin & Sons, 473 W. 2 St., Ogden, Utah, LB, $225,717, sewerage teratment plant, BRIGHAM CITY, UTAH. Brigham City Corp., City Hall, Brigham City, Utah. Bids July 21. CD 7/12;

R. W. Coleman, Ogden, Utah, LB, $206,991, north and south outfall line for sewerage sys. (Brigham City, Utah).

Argentieri and Colarossi, 1815 Jackson St., Seattle, Wash., CA $128,229, (7 bidders) est. $134,850 47,600 ft. 4- to 8-in. steel water mains, ALDERWOOD MANOR, WASH. Alderwood Manor Water Dist., Alderwood Manor, Wash. Bids July 25. CD 7/14.

Davidson Electric & Western Electric Constr. Co., 1639 N.E. Raleigh, Portland, Ore., LB $138,889, 71 mi. electric transmission line, Crook and Grant Counties, OREGON. Central Electric Co-operative, Redmond, Ore.

† Zachary Constr. Co., Everett, Wash., CA $147,075, clear right of way and constr. access roads for Sandy-Oregon City sections of Big Eddy-Oregon City and Big Eddy-Bethany lines; clear site for Oregon City Sub-station 30.5 mi., Clackamas Co. Inv. 7667, OREGON. Bonneville Power Admin., 1001 N.E. Lloyd Blvd., Portland, Ore. I. C. Stewart, 1001 N.E. Lloyd Blvd., Portland, Ore., engr. Bids June 3, awarded June 30.

General Constr. Co., 4850 N.W. Front St., Portland, Ore. LB $329,289, rehabilitate and extend Slip No. 2, PORTLAND, ORE. P. Docks Comn., 3070 N.W. Front St., Portland, Ore. Thos. Guerin, 3070 N.W. Front St., Portland, Ore., engr. CD 5/26/54.

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Charles L. Harney, 575 Berry St., San Francisco, Calif., LB, $1,744,213 (7 bidders) imprv. facilities, San Francisco-Oakland Bay Bridge toll plaza and Port of Oakland overcrossing in Oakland, Alameda Co. Bids July 27. CD 7/5.

† U. S. Eng., 180 New Montgomery St., San Francisco, Calif., rejected bids sewage treatment plant, Benicia Arsenal, Eng. 55-527, BENICIA, CALIF. LB $329,884. CD 6/28, under LB.

Pat Barkley, 2870 Stevens Creek Rd., San Jose, Calif., LB $74,914. (9 bidders) water distr. sys. and water well HOLLISTER, CALIF. Sunnyslope County Water Dist. Box 342, Hollister, Calif. John C. Luthin, 16340 E. Maple Grove St., Puente, engr.

Chicago Bridge and Iron Co., White-Henry-Stuart Bldg., Seattle 1, Wash., CA $92,679, (5 bidders) two 1 m.g. steel reservoirs, MOSES LAKE, WASH. City, City Hall, Moses Lake Wash. Bids July 26. CD 7/14.

Shoreline Constr. Co., 12519 15 Avenue N. E., Seattle 55, Wash., LB $196,447, (5 bidders) booster pump station, 75,400 ft. 4- to 10-in. steel water mains, RENTON, WASH. Water Dist. 90, 18231 S.E. 128 St., Renton, Wash. Bids July 28. CD 7/20.

Nick Debek, 11258 E. Rush St., Del Monte, Calif., LB $96,390. (5 bidders) storm sewers in vicinity of Rte. 5. SAN JOSE, CALIF. City, City Hall, San Jose. H. J. Flannery, City Hall, city engr.

BUILDINGS—LB & CA

▲ H. Valle Co., Inc., 407 3 Ave. W., Seattle, Wash. CA $3,375,000, 2 story and basement 114,000 sq. ft. DEPARTMENT STORE, for Frederick & Nelson, BELLEVUE, WASH. Marshall Field & Co., 111 N. State St., Chicago, Ill. J. Graham & Co., 1426 5 Ave., Seattle, Wash., engrs. CD 2/4.

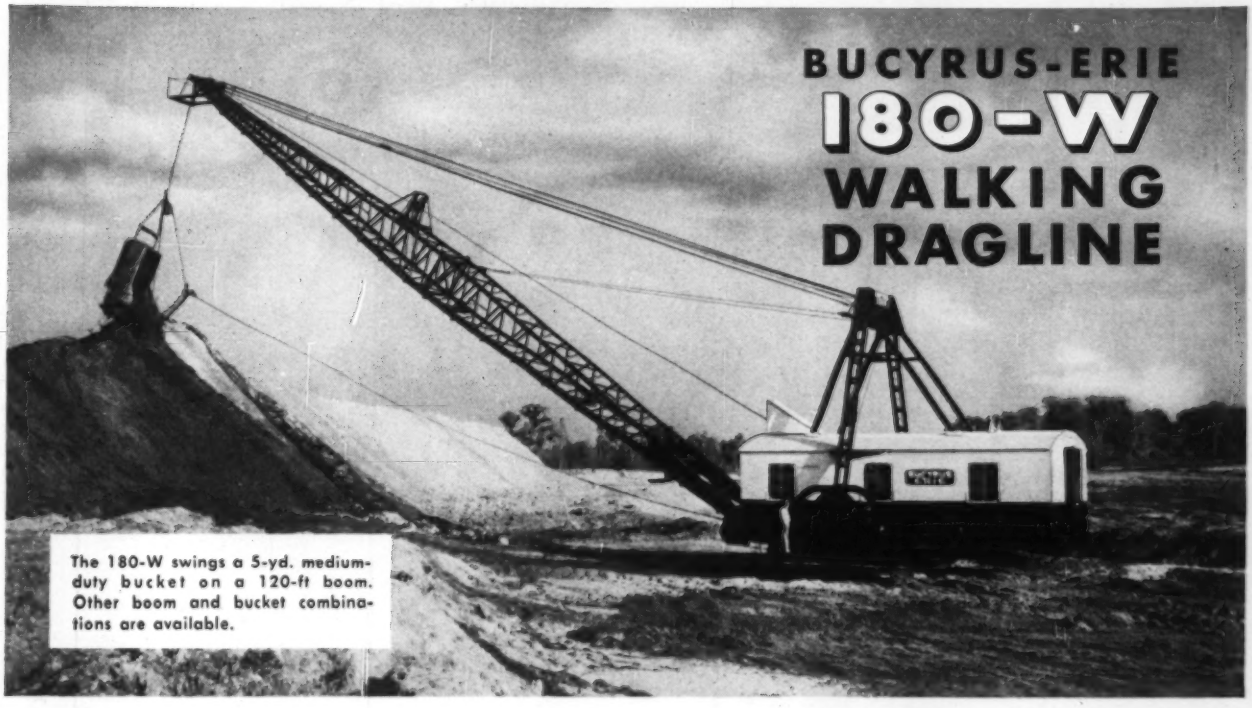
▲ J. B. Boespflug Constr. Co., 1912 4 Ave. S., Seattle, Wash., CA, $1,750,000. 2 story, 201x291 ft. steel, rein.-con. DAIRY PLANT and 128x210 ft. GARAGE on piling foundation, SEATTLE, WASH. Carnation Co., 400 5 Ave. N., Seattle, Wash. CD 3/29.

Teller Constr. Co., 845 N. Graham St., Portland, Ore., CA $400,000, store remodeling, PORTLAND, ORE. J. C. Penney & Co., Mead Bldg., Portland, Ore. Church, Newberry & Roehr, Builders Exchange Bldg., Portland, Ore., archts. Awarded July 25.

▲ Oscar R. Wayman, 3125 N.W. Front St., Portland, Ore., CA $4,234,828, 75 room HIGH SCHOOL, 82nd and Alameda Sts., PORTLAND, ORE. Multnomah School Dist. 1, 631 N.E. Clackamas St., Portland, Ore. Bids July 20, awarded July 25. CD 7/6, under LB.

(Continued on page 133)

HERE'S BIG-CAPACITY DIGGING ABILITY YOU CAN MOVE FROM JOB TO JOB



The 180-W swings a 5-yd. medium-duty bucket on a 120-ft boom. Other boom and bucket combinations are available.

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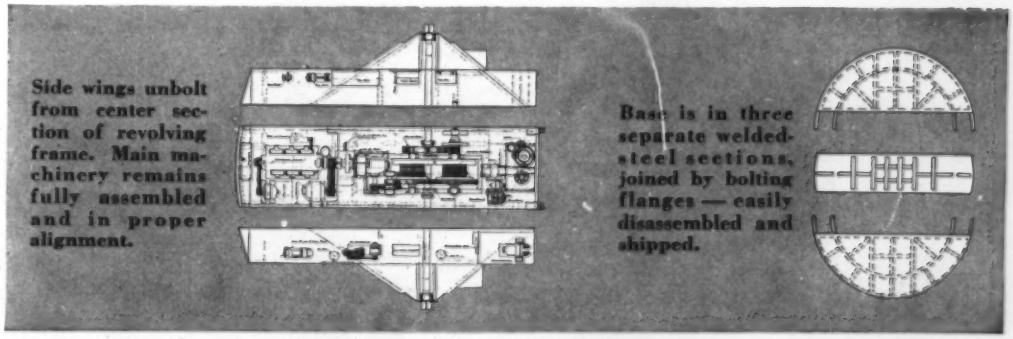
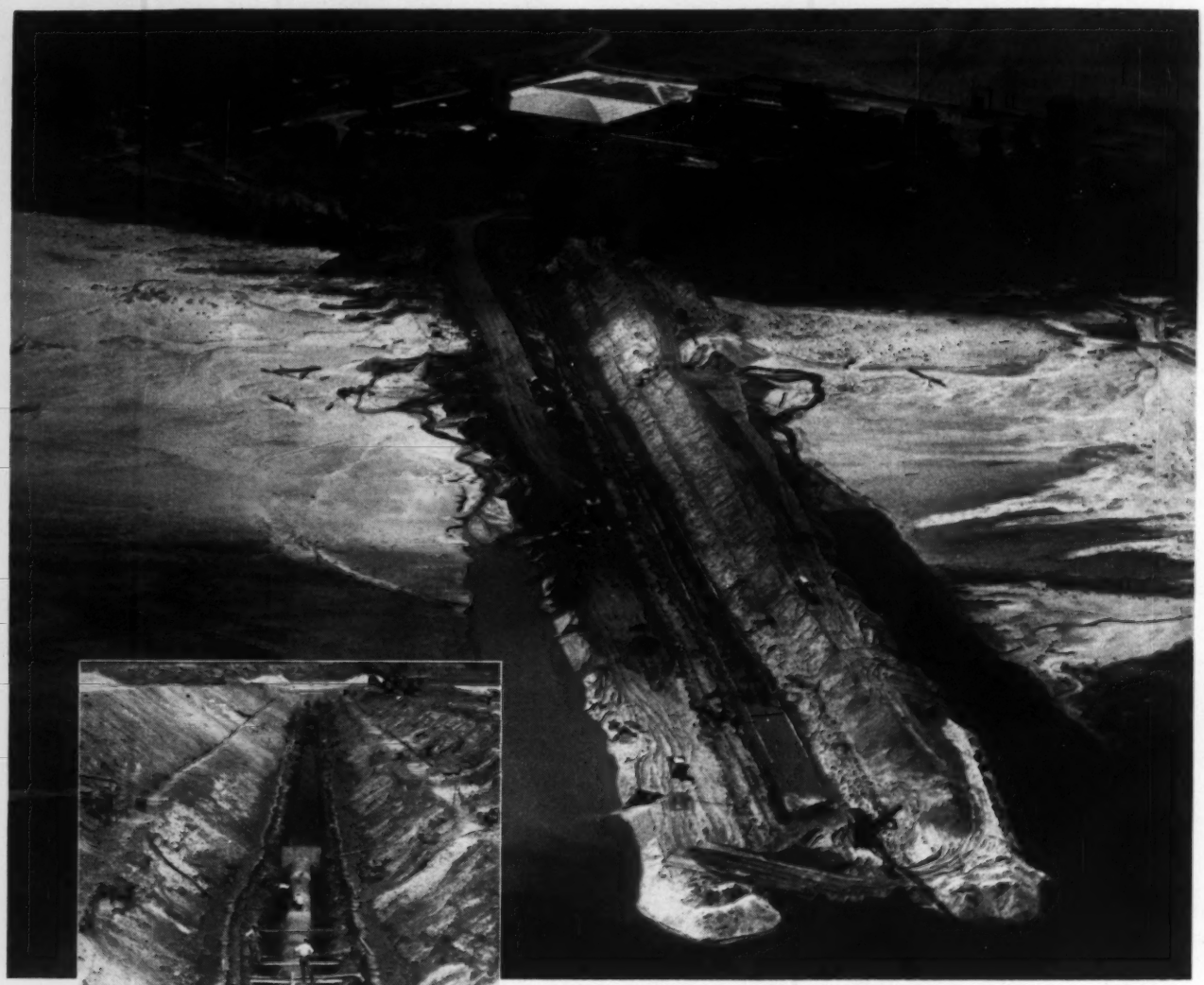
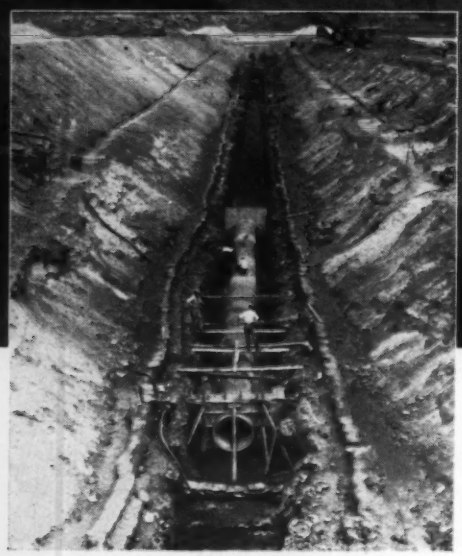
5 U. S. RAILROAD CARS CARRY ENTIRE MACHINE


Side wings unbolt from center section of revolving frame. Main machinery remains fully assembled and in proper alignment.
Base is in three separate welded-steel sections, joined by bolting flanges — easily disassembled and shipped.





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553

(Continued from page 130)

▲ **Fred J. Twaits Co.**, 449 S. Beaudry St., Los Angeles, Calif., LB $2,096,000. HOSPITAL ARCADIA, CALIF. Hospital Foundation of the Methodist Church, 2826 S. Hope St., Los Angeles, Calif. Bids July 27. CD 7/13.

▲ **C. W. Driver, Inc.**, 3416½ W. First St., Los Angeles, Calif. LB $1,020,000 Burbank High School AUDITORIUM and addns., BURBANK, CALIF. Burbank Unified School Dist., 245 E. Magnolia St., Burbank, Calif. Bids July 28.

McDonald Bros., 660 W. Adams Blvd., Los Angeles, Calif., CA $790,200. 82 frame, stucco DWELLINGS Fairvalley Ave., Groverdale St., COVINA, Calif. B-L-C Highlands, 660 W. Adams Blvd., Los Angeles, Calif.

▲ **B & E Building Co.**, 470 S. Beverly Dr., Beverly Hills, Calif., CA $1,782,000, 162 frame, stucco DWELLINGS in Tract 16463, EL SEGUNDO, CALIF., Condon Land Co., 258 S. Beverly Dr., Beverly Hills, Calif.

R. Pedersen & Son, 446 Clark St., Fresno, Calif., LB $508,980 (8 bidders) frame, stucco Scandinavian SCHOOL No. 3, corner Backer and Weldon Sts. FRESNO, CALIF. Scandinavian Elementary School Dist., c/o supt., 3232 N. Sierra Vista St., Fresno, Calif. Bids July 26.

▲ **Lindgren & Swinerton, Inc.**, 1631 Beverly Blvd., Los Angeles, Calif., CA $1,040,000. concrete mfg. and WAREHOUSE, FULLERTON, CALIF. Kimberly Clark Corp., 128 N. Commercial St., Neenah, Wis. Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., archts. CD 12/1/54.

Lessley Construction Co., 640 Bancroft Ave., San Leandro, Calif., Owner Builds, $592,500. 79 HOME subdivision, IRVINGTON, CALIF.

▲ **Morley Building Co.**, 7700 Sunset Blvd., Los Angeles, Calif., LB $2,035,800. Narbonne High SCHOOL ADDNS., LOS ANGELES, CALIF. Bd. of Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids July 29. CD 7/6.

▲ **Bollenbacher & Kelton, Inc.**, 945 N. La Cienega Ave., Los Angeles, Calif., CA $1,101,000, 121 frame, stucco DWELLINGS, Abbey, Hurley and Porimer Sts., PUENTE, CALIF. Gabriel Realty Corp., 945 N. La Cienega St., Los Angeles, Calif.

▲ **Standard Building Co.**, 2222 19 Ave., San Francisco, Calif. Owner Builds. $5,000,000. 250-home subdivision known as Forest Knolls in Sutro Forest Sector. SAN FRANCISCO, CALIF. CD 2/5/47.

Certified Builders, 251 O'Connor Dr., San Jose, Calif., Owner Builds, $365,500. 43 HOME subdivision, on Shearton Dr. and Wigdet Dr., SAN JOSE, CALIF.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Quebec**—BA 8/23—St. Lawrence Seaway Auth., 1225 N. 2 Temporary Bldg., Ottawa, Ont., Cote Ste. Catherine Lock and approaches in Lachine section of St. Lawrence Seaway Proj. Plans deposit $100. A. Gordon Murphy, 685 Cathcart St., Montreal, ch. engr. CD 9/9.

BUILDINGS—BA

▲ **Ont., Sarnia**—CATALYTIC REFORMER—BA 8/15—Imperial Oil Ltd., 445 S. Christina St., catalytic reformer, incl. naptha processing equipment, towers and tanks. $5,000,000. CD 7/13.

BUILDINGS—SLC

Ont., Hamilton—TERMINAL OFFICES, etc.—Canadian Petrofina, Ltd., 21 Richmond St. W., Toronto, soon lets contract terminal offices, garage and warehouse. $500,000.

Ont., Toronto—STORAGE DEPOT—Canadian Petrofina, Ltd., 21 Richmond St. W., soon lets contract terminal offices, garage and warehouse. $500,000. CD 7/5.

HEAVY CONSTRUCTION—LB & CA

MANITOBA—Manitoba Dpt. P. Wks., Parliament Bldgs., Winnipeg,

E. A. Barager & Sons, Elm Creek, Man., CA, $97,705. grading 11.1 mi. Hy. No. 10 from The Pas to Prospector. CD 6/4/51.

Terminal Constr. Co., Ltd., Dominion Square Bldg., Montreal, Que., LB, $293,180, aircraft parking apron, taxiway, access road and car parking area, Stephensville airport, STEPHENSVILLE, NEWFOUNDLAND. Dpt. Transport, Ottawa, Ont. Bids July 22. CD 7/8.

T. C. Gorman Constr. Co., Ltd., 248 McChord St., Montreal, Que., LB, $116,168, rehabilitation of wharf and bank on west side Atlantic Entrance, excavation to new line lake entrance, St. Peter's Canal, ST. PETER'S, N. S. Dpt. Transport, Hunter Bldg., Ottawa, Ont. (Correction—status). CD 7/5, under CA.

Standard Paving Maritime Ltd., Lady Hammond Rd., Halifax, N. S., CA $212,629, sewer and water extens., SOUTH WOODSIDE, N. S. County of Halifax, Administrative Bldg., Halifax, N. S. Awarded July 22. CD 5/15/50.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto,

Ont.—**Sir. Robert MacAlpine & Sons (Canada) Ltd.**, Box 249, Weston, Ont., LB $466,335 (6 bidders) grading, culverts, granular base, hot mix paving 6.5 mi. Hy. 3, from Delhi to Courtland, Contr. 55-153;

Ont.—**Johnson Bros. Co. Ltd.**, 37 Market St., Brantford, Ont. LB $207,284 (6 bidders) resurf. and granular base 6.8 mi. Hy. 53 between intersections Hys. 2 and 6, Contr. 55-443;

Ont.—**M. G. Henniger, Ltd.**, Union St., Smiths Falls, Ont., LB $199,506 (3 bidders) granular base, hot mix paving along 7.3 mi. Hy. 29 from Forthton to 1 mi. south of Frankville, Contr. 55-154;

Ont.—**F. Pidgeon & Sons**, 94 Sheldon Ave., Chatham, Ont. LB $292,543 (4 bidders) grading, culverts, granular base along 5 mi. Hy. 80 from Glencoe to Walkers Corners, Contr. 55-148. CD 4/27/44.

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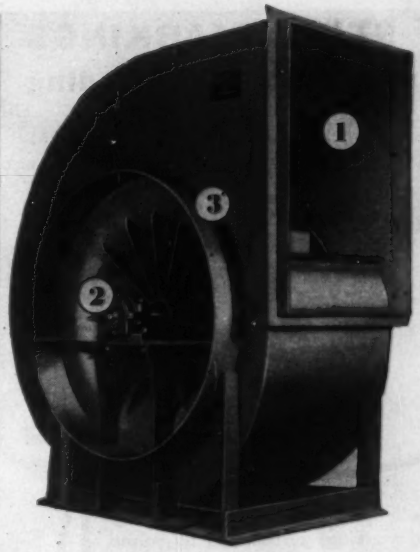

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"Buffalo" Type "BL" Limit-Load VENTILATING FAN The photo above shows three of the unique features in the "BL" Fan which are giving users more for their money: (1) properly proportioned housing, streamlined for peak efficiency; (2) "Buffalo" self-aligning bearings (choice of sleeve or anti-friction type) for easiest maintenance and longest life; and (3) large, smooth inlet collar for easy duct connection.

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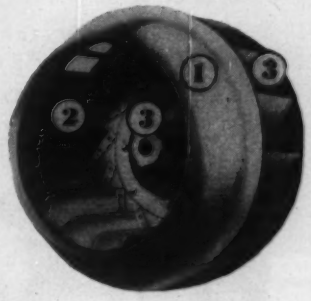

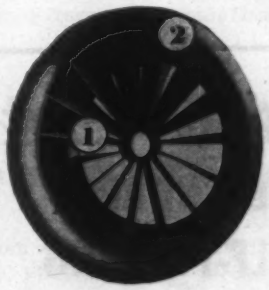

FREE-FLOW INLET Note "Buffalo" inlet guide vanes (1) which assure full rated delivery with minimum turbulence even when inlet conditions are unfavorable. Inlet losses are further reduced by the smooth, die-formed inlet bell (2) which matches the wheel shroud.

These and other features contribute to the famous "Buffalo" "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life — the best value you can recommend in a fan. For full details, write for Bulletin F-102.

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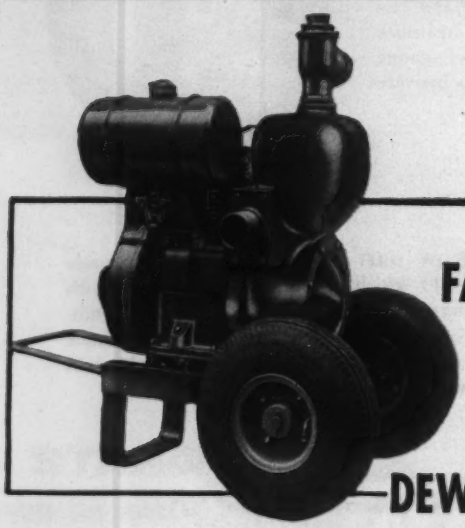

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▲ **Canadian Dredge & Dock Co. Ltd.**, Harbor Commission Bldg., Toronto, Ont., CA $4,374,020 (3 bidders) channel imprvs. incl. approx. 2 m. cu. yds. common excavation; and pier constr. adjacent to Chimney Island in St. Lawrence River in connection with St. Lawrence Seaway and Power Proj., Cornwall, ONTARIO. Ontario Hydro-Electric Power Comn., 620 University Ave., Toronto, Ont. Bids July 12, awarded July 29. CD 6/27.

Brant Constr. Co. Ltd., 33 George St., Brantford, Ont., CA, $132,277, (5 bidders) 5,800 ft. 27 in. and 5,500 lin. ft. 24 in. concrete trunk sanitary sewer in Oshawa Creek Valley, OSHAWA, ONT. City, City Hall, Oshawa, Ont. Bids July 18, awarded July 22. CD 7/5.

Domex Co. Ltd., 1323 Bay St., Toronto, Ont., LB, $130,264 (11 bidders), reinforced precast concrete parking deck over open-cut portion of subway at Pleasant Blvd. near St. Clair Ave., TORONTO, ONT. Parking Authority of Toronto, 414 Bay St., Toronto, Ont. July 22. CD 6/29.

Adelard Jacques Ltd., 511 Short St., Sherbrooke, Que., LB, $294,900. MARKET BLDG., Lansdowne Market, King St. W., SHERBROOKE, QUE. City, H. P. Emond, clk., Sherbrooke, Que. A. Pulin, 1115 Prospect St., Sherbrooke, Que., archt.

▲ **D. Lamothe, Ltd.**, 209 Ninth St., Noranda, Que. CA $1,500,000. replace old wooden dam at Lake Cabonga, 92 mi. north of Maniwaki, with rein.-con. fill dam, approx. 1,100 ft., QUEBEC. Provincial Dpt. of Hydraulic Resources, Parliament Bldg., Quebec City, Que. CD 4/13/54.

BUILDINGS—LB & CA

▲ **Burns & Dutton Concrete & Constr. Co.**, 5440 1st St. W., Calgary, Alta., CA $1,623,137, provincial AUDITORIUM, CALGARY, ALTA. Alta. Govt., Dpt. P. Wks., Parliament Bldgs., Edmonton, Alta. Bids June 13, awarded July 25.

▲ **Burns & Dutton Concrete & Constr. Co.**, 9004 125 Ave. E., Edmonton, Alta., CA $1,636,187, AUDITORIUM, EDMONTON, ALTA. Alta. Govt., Dpt. P. Wks., Parliament Bldgs., Edmonton, Alta. Bids June 13, awarded July 25. CD 6/8.

▲ **Angus Robertson, Ltd.**, 5035 Western Ave., Montreal, Que., CA Est. $1,000,000. (13 bidders) 3 story, no bsmnt., 100x275 ft. rein.-con. fdn. and slab concrete, brick and tilewalls SHIPPING and STORAGE BLDG., ST. JOHN, N. B. Atlantic Sugar Refineries Ltd., 485 McGill St., (Box 7), Montreal, Que. Bids July 19, awarded July 26. CD 7/12.

▲ **Eastern Woodworkers, Ltd.**, Brother St., New Glasgow, Nova Scotia, CA $1,169,297 (2 bidders) 116 HOUSING UNITS, (81 bldgs.), Gander Air Base, GANDER, NEWFOUNDLAND. Central Mortgage & Housing Corp., 1032 Gottingen St., Halifax, Nova Scotia. Bids July 19, awarded July 27. CD 7/6.

▲ **M. F. Schurman Co. Ltd.**, Eustane St., Summerside, Prince Edward Island, CA $1,195,044 (10 bidders) 125 HOUSING UNITS, 22 bldgs. with services, Royal Canadian Air Force Base, CHATHAM, N. S. Central Mortgage & Housing Corp., 1032 Gottingen St., Halifax, N. S. Awarded July 27.

Standard Constr. Co. Ltd., 101 Upper Water St., Halifax, N. S., CA $957,751, 100 HOUSING units, 75 bldgs. for married personnel, Shearwater Naval Air Base, across Halifax Harbor, HALIFAX, N. S. Central Mortgage & Housing Corp., 1032 Gottingen St., Halifax, N. S. Bids July 12, awarded July 27. CD 6/27.

John Porter & Co., 641 Coronado Dr., Tecumseh, Ont. Owner Builds, $480,000. HOUSING, forty 32x36 ft. bungalows, poured concrete fdn., brick veneer walls, built-up tar and gravel roof, TECUMSEH, ONT.

R. Timms Constr. & Engrg. Ltd., Box 305, Lincoln St. W., Welland, Ont., CA $782,200 (9 bidders) 2-story, 62x250 ft., 1-story, 80x200 ft., Burnamthorpe Rd. HIGH SCHOOL, 30x60 ft. heating plant, concrete block fdn., brick walls, steel frame, TORONTO, ONT. Etobicoke Bd. Educ., 4969 Dundas St. W., Toronto, Ont. Bids May 10, awarded June 10. CD 4/26.

Russell Constr. Ltd., Harbor Commission Bldg., Toronto, Ont., CA $281,600 (9 bidders) 1 story, approx. 135x150 ft. Street Cleaning GARAGE; 1 story, approx. 86x90 ft. triangular shaped service bldg. and addn. of 2nd story to existing 1-story bldg. and boiler house exten., TOPONTO, ONT. City, City Hall, Toronto, Ont. Bids July 25, awarded July 27. CD 7/8.

▲ **Co-operative Housing Syndicate of Beloiel**, 1285 St. Andre St., Beloiel, Que. Owner Builds. $1,000,000. 75 units HOUSING, BELOIEL, QUE. Marchand & Longpre, 1285 St. Andre St., Beloiel, Que., archts.

Montclair Constr. Co. Ltd., 5515 Western Ave., Montreal, Que., CA $600,000. 4-story bsmnt., rein.-con., frame APARTMENT bldg., incl. 32-car garage in bsmnt., Laird Blvd. and Sherwood Cres., MONTREAL, QUE. Woodcraft Manor, Inc., c/o general contr. Patsy Colangelo, 8529 St. Lawrence Blvd., Montreal, Que., archt. Irving S. Backler, 5253 Decarie Blvd., Montreal, Que., engr. Awarded July 25.

Ideal Constr., Inc., 1755 Morgan Blvd., Montreal, Que. Owner Builds. $540,000. 12 three-story bsmnt. wood and brick frame, APARTMENTS on Morgan Blvd. and Darling St., MONTREAL, QUE. Jean Paul Bayard, 506 St. Catherine St. E., Montreal, Que., archt.

J. Albert Normand, L'Islet, Que., CA, $450,000. 3 story, rein.-con. fdn., frame, brick, RETREAT HOUSE for religious order, STE. ANNE DE LA POCATIERE, QUE. Rev. Peres Oblates de Marie-Immaculee, Ste. Anne de la Pocatiere, Que. Paul Emile Mathieu, 414 Bossieau Ave., Quebec City, Que., archt. Awarded July 22. CD 9/24/53.

(Continued on page 136)

Installation: VMP MOBILWALLS for the Philadelphia Life Insurance Company at 111 N. Broad Street, Philadelphia, Pa.
Contractor: Fleming Company, 1717 Sansom Street, Philadelphia 3, Pa.

"VMP MOBILWALLS helped me meet a tight construction schedule"

Prompt delivery counts. This compliment from Charles J. Fleming, President of the Fleming Company, Philadelphia building construction firm, expresses the satisfaction that contractors feel when they deal with VMP. They can depend on fast deliveries. VMP MOBILWALLS always fit. No time is lost in erection with local VMP crews on the job.

VMP's metal movable MOBILWALLS slash installation time, keep that new look for years. Contractors everywhere are getting the word about the businesslike spirit behind VMP's erection and service crews. And warehouses have big stocks of metal MOBILWALLS available for immediate delivery.

Also, VMP works closely with the contractor . . . bidding with good sharp prices . . . giving expert attention to new and remodeling projects. Get the facts about VMP; write Dept. ENR-8 for VMP MOBILWALL catalog showing the variety of partitions available.

Virginia Metal Products, inc.

ORANGE, VIRGINIA

Subsidiary of Chesapeake Industries, Inc.

(Continued from page 134)

U. S. POSSESSIONS

BUILDINGS—BA

† Guam—HOSPITAL—BA 9/30—At P. Wks. Office, Marine Dr., Tamuning, Guam, fifth Increment for 4 story, 37x322 ft. rein.-con. permanent Guam Memorial Hospital, Spec. P.W.B-22-55. Plans deposit $75. Rothwell & Lester, 821 Alaska St., Honolulu 13, Hawaii, engrs.-archts.

ALASKA

HEAVY CONSTRUCTION—LB & CA

▲† W. A. Smith Contrg. Co. Inc., Anchorage, Alaska, LB $530,005 (2 bidders) Schedule A-1, two towers and foundations for 3rd, bldgs., utilities, etc. for Military Installations at Indian Mountain, Inv. 56-14. ALASKA. U. S. Eng., Anchorage, Alaska. Bids July 29. CD 7/13.

Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho, LB $489,620. est. $545,250 (2 bidders) Schedule B-1, addnl. Air Force facilities, Sparrevohn (Alaska).

† Pacific Mechanical Contractors, Inc., 10211 E. Marginal Way, Seattle, Wash., LB $129,000 (6 bidders) chlorinator plant with connecting pipe lines, Proj. Aaa 50-A-210, KETCHIKAN, ALASKA. Alaska P. Wks., Dpt. Interior, 123 W. 3 St., Juneau, Alaska. Bids July 27. CD 7/11.

Misco-West Coast Inc., 4608 36 Ave. S. W., Seattle, Wash., LB $591,030. POWER HOUSES, steel penstock, sub-station and operator's cottage for Purple Lake Hydro-Project, METLAKATLA, ALASKA. Metlakatla Indian Community, Metlakatla, Alaska. Bids July 23. CD 6/29.

Proposed Projects

WATER SUPPLY

Calif., Bonsall—Bonsall Heights Water Dist., (part of Rainbow Municipal Water Dist.,) Bonsall, $175,000 bond election Aug. 12, water line connection to Metropolitan Water District.

Calif., Cucamonga—Cucamonga County Water Dist., Court House, San Bernardino, main trunk line connection to Metropolitan Water Dist. Aqueduct, $900,000.

Ga., Lawrenceville—Gwinnett County Water Auth., Lawrenceville, 10 m.g. per day waterworks, $500,000.

Mass., Maynard—Town, Bd. P. Wks., Town Hall, water relay sys., $500,000.

▲ Mont., Glendive—City, City Hall, $1,400,000 bond election Aug. 22, expanding city water and sewerage systems.

▲ New Jersey—State, State Capitol, Trenton, reservoir in Chimney Rock, Somerset Co. to serve North Jersey area, $102,650,000. Tippets-Abbett-McCarthy & Stratton, 62 W. 47 St., New York, N. Y., consult. engrs. CD 5/21/44.

O., North Royalton—Village, Town Hall, $375,000 bond election Nov. 8, water mains. John Petsche, 13868 Bennett Rd., village engr. CD 11/8.

▲ O., Painesville—Lake Erie Water Co., c/o Chas. Stewart Mott, Flint, Mich., supply water west of here in Lake Co. with plant capable of providing 10 m.g. per day; exten. present water facilities. $3,000,000. Havens & Emerson, Leader Bldg., Cleveland, consult. engrs.

O., Tiro—Village, Carl Baker, mayor, water main from Shelby to Tiro, distr. sys. in Tiro. $105,200.

O., Westerville-City, bond election Nov. 8, dam and reservoir, $185,000; 10 in. water main and storage tank to improve water supply sys., $150,000. CD 7/29/54.

Okla., Vinita—City, water main extensions, $100,000. Lee M. Bush & Co., Colcord Bldg., Oklahoma City, consult engrs. Aleda Warren, City Hall, engr.

Tex., Denton—City, c/o Mayor, water treatment plant. $350,000. Freese & Nichols, 407 Danciger Bldg., Ft. Worth, consult. engrs.

Tex., Lancaster—City, WW sys. rehabilitation work, $50,000; water lines and storage, $90,000, due to recent annexing of 4,000 acres.

SEWERS, WASTE DISPOSAL

Fla., Coral Gables—City, City Hall, trash and garbage incinerator. $500,000-$650,000. M. H. Connell & Assocs., Langford Bldg., Miami, consult. engrs. CD 11/9/44.

Ill., Edwardsville—City, George Moorman, mayor, City Hall, bond election Aug. 16, storm water sewers, addnl. sanitary sewers and sewage treatment plant imprvs. $750,000. CD 11/29/45.

Ind., Anderson—City, City Hall, incinerator plant. $100,000 or more. C. L. Todd, 126 S. 22 St., Richmond, archt.

Kan., Salina—City, City Hall, sewage treatment plant. $150,000. Wilson & Co., P.O. Box 28, Salina, consult. engrs.

▲ Mich., Flint—Bd. Supervs. Genesee Co., G. R. Friley, chn., sewerage system, sewage disposal plant, sanitary sewers, interceptor sewers, treatment facilities. $12,000,000. Johnson & Anderson, 1307 Pontiac State Bank Bldg., Pontiac, consult. engrs. CD 7/7.

Minn., Sauk Rapids—Village, N. Hollenhorst, clk., sewage disposal plant, sanitary sewer extens. $125,000. G. M. Orr Eng. Co., 1004 Marquette Ave., Minneapolis, consult. engr.

▲ Mo., St. Louis—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 and Market Sts., Zone 3, plans by Albert Osburg, city archt., 301 City Hall, 12 and Market Sts., Zone 3, 2 to 5 levels, 67 ft. high, brick, concrete block masonry, steel incinerator adjacent to foot of East Grand Ave. $1,275,000. Greeley & Hansen, 220 S. State St., Chicago, Ill., consult. engrs. Walter R. Crecelius, ch. city engr. CD 7/21.

Okla., Vinita—City, sanitary sewer extensions, $100,000. Lee M. Bush & Co., Colcord Bldg., Oklahoma City, consult. engrs. Aleda Warren, City Hall engr.

Tex., Arlington—M. C. Andrews Jr., 320 S.E. 9 St., Grand Prairie, storm sewers, $75,000; sanitary sewers, $75,000, in "Hillcrest Park" Subdivision.

Tex., Corsicana—City, c/o Walter Erwin, mayor, Corsicana, bond election Oct. 11, sanitary sewerage sys. imprvs., extens., sewage treatment plant. $750,000. Reaves & Gregory, 3332 W. 7 St., Ft. Worth, consult. engrs. CD 6/28.

Tex., Dallas—Centex Constr. Co., 4606 Greenville St., sanitary sewers, $100,000; storm sewers, $85,000, in northwestern section of city.

Tex., Dallas—Keele-Jones Constr. Co., Inc., 2911 S. Lancaster St., sanitary-storm sewers in NE section of city. $105,000.

Tex., Fort Worth—City, City Hall, 5 mi. 12- to 30-in. sanitary sewer line along Cottonwood Creek north of Handley. $375,000. Freese & Nichols, 407 Danciger Bldg., consult. engrs. CD 2/1/54.

Tex., Grand Prairie—Centex Constr. Co., 4606 Greenville St., sanitary sewers, $79,700; storm sewers, $76,500, in large tract south city limits.

Tex., Houston—Canterbury Village, Valentine Land Co., c/o Jno. Wheat, Bank of Commerce Bldg., Houston, 4th Section, storm sewers, $75,000; sanitary sewers, $79,500, Canterbury Village.

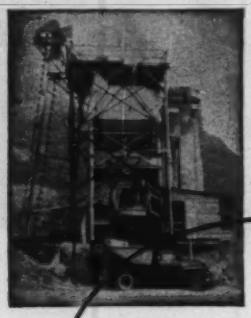
Tex., Houston—Vest & Sterkey, 9714 Bassoon St., storm sewers, $77,500; sanitary sewers, $82,500, Westbury Addition.

Tex., Lancaster—City, sanitary sewers, $100,000; storm sewers, $75,000, for annexation 4,000-acres, adjacent to city limits.

(Continued on next page)

"THAT'S REALLY THE WAY TO HANDLE CONCRETE"

says L. G. (Bud) Waigand, Project Manager, Peter Kiewit Sons Co.



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How would you haul and place 16,000 yards of concrete on a big water reservoir job, with pours scattered all over . . . and with a tight schedule?

Peter Kiewit picked two 3-yard Dumpcretes, mounted on light, short-wheelbase Chevrolet trucks for their U. S. Bureau of Reclamation job near Salt Lake City.

"We liked the Dumpcretes because they're fast," says Mr. Waigand, "and because they place equally well into forms, buckets or collecting hoppers. They're rugged too, and cause little downtime."

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City_____ State_____

▲ W. Va., Dunbar—City sewage plant and sewerage sys. $1,250,000. J. H. Milam, city engr.

BRIDGES

Mississippi—Louisville & Nashville R.R. Co., L. L. Adams, ch. engr., 908 W. Broadway, Louisville, Ky., main line railroad bridge at Baldwin Lodge. $810,000.

ONTARIO—Dpt. Hys., Toronto,
Belleville—320 ft. bridge over Moira River north of here. $300,000. Lazarides, Lount & Partners, 79 Scollard St., Toronto, consult. engrs.

▲ ONTARIO—Dpt. Hys., Toronto,
Belleville—bridge over Trent River and Hy. 23, T-P Hy. $1,500,000. J. D. Lee & Co. Ltd., 83 Clarence St., Kingston, consult. engrs. CD 6/10.

STREETS AND ROADS

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,
Contra Costa Co.—traffic signals, hy. lighting channelization U.S. 40 at main entrance to Union Oil Co. at Oleum, $106,600.

El Centro Co.—surf., applying seal coat 12.7 mi. between Adams Ave. in El Centro and Brawley, $125,000.

Los Angeles Co.—protective planting 0.7 mi. Colorado Freeway between Melrose Ave. and Linca Vista Ave. off ramp, $90,000.

Monterey Co.—protective planting 6.1 mi. between Hartnell Rd. and Main St., $107,500.

Plumas Co.,—grading, installing flashing lights 4.5 mi. Taylorsville-Arlington Rd., F.A.S. S-SG-1062 (2), $116,000.

Sacramento Co.—grading, surf. 1.4 mi. Watt Ave., between Arcade Creek and A St. FAS 8-933 (2) $220,000.

San Francisco Co.—traffic signals, hy. lighting and channelization at Crescent Ave. entrance to Farmers Market, $82,000.

San Luis Obispo Co.—protective planting 2.4 mi. between Marsh St. and San Luis Obispo Creek, $85,500.

Stanislaus Co.—grading, surf. and constr. bridge on El Vista Ave between Encina Ave. and Scenic Dr. near Modesto FAS S-1226 (1), $185,000.

Tehama Co.—grading, surf. 4.4 mi. Dales-Manton Rd., FAS S-1081 (4), $170,000.

Ventura Co.—grading, paving and structures 3.9 mi. State 138 from U.S. 101 to 0.3 mi. south of Mill School $1,882,263.

Yolo Co.—base, surf. 4 mi. County Road 139 between Clarksburg and Freeport Bridge, FAS S-1157 (1), $120,000.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City,
Okmulgee Co.—grade, drain 5.687 mi. U.S. N. 169, north of Henryetta. $353,000. G. H. Bittle, c/o owner, engr.

Tex., Dallas—Centex Constr. Co., 4606 Greenville St., asph. paved streets, c. conc. curbs, gutters in northwestern section of city. $100,000.

Tex., Lancaster—City, street imprvs., surf. for annexation of 4,000 acres adjacent to city limits. $125,000.

Tex., Pasadena—Sears, Roebuck & Co., 4207 Main St., Houston, drainage and asph.-paved 1,800 auto parking center, $100,000; hard-paved area adjacent to store proper, $80,000.

Utah, Salt Lake City—State Bldg., 419 State Capitol, Salt Lake City, black topping roads and parking lots and curbs, gutters at University of Utah, $100,000.

Wash., Kirkland—City, City Hall, draining, ballasting, resurf. streets and constr. sidewalks, curbs, gutters. $300,000. Bids in August. R. W. Beck & Assocs., Tower Bldg., Seattle, Zone 1, consult. engrs. CD 3/16.

N. S., New Glasgow—Town, Town Hall, paving, town imprvs. $251,000. Fraser McDonald, c/o owner, road supt.

EARTHWORK, WATERWAYS

Tex., Beaumont—Jefferson Drainage District No. 6, Beaumont, drainage program for Hy. 90 Freeway west of 11 St. $769,000. CD 3/30/43.

Wash., Naches—Naches-Selah Irrigation Dist. Naches, bond election Aug. 12, 4 addnl. tunnels to replace deteriorated flume-and-trestle work. $465,045. Gray & Osborne, 228 W. 2 St., Yakima, consult. engrs. CD 6/29.

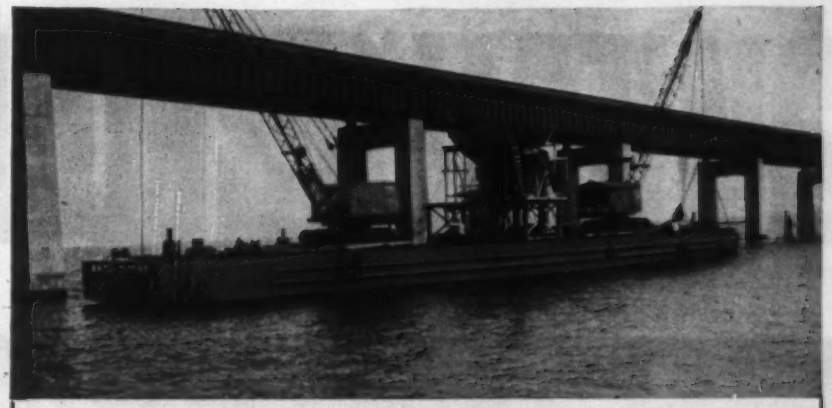
AIRPORTS

▲ Fla., Miami—OFFICE BLDG.—National Airlines, 324 N.W. 27 Ave., plans by Robert Law Weed & Assoc., 550 Brickell Ave., general administration office bldg., Miami International Airport. $1,000,000. CD 10/29/52.

▲ Tex., Dallas—HOME BASE—City, City Hall, Main and Harwood Sts., home base for Braniff International Airways, occupancy 35-acre site at Love Field. $4,000,000. CD 1/30/53.

Tex., Houston—HANGAR—Eastern Airlines, c/o L. P. Arnold, Houston International Airport, Houston, hangar, Houston International Airport. $375,000.

(Continued on page 140)



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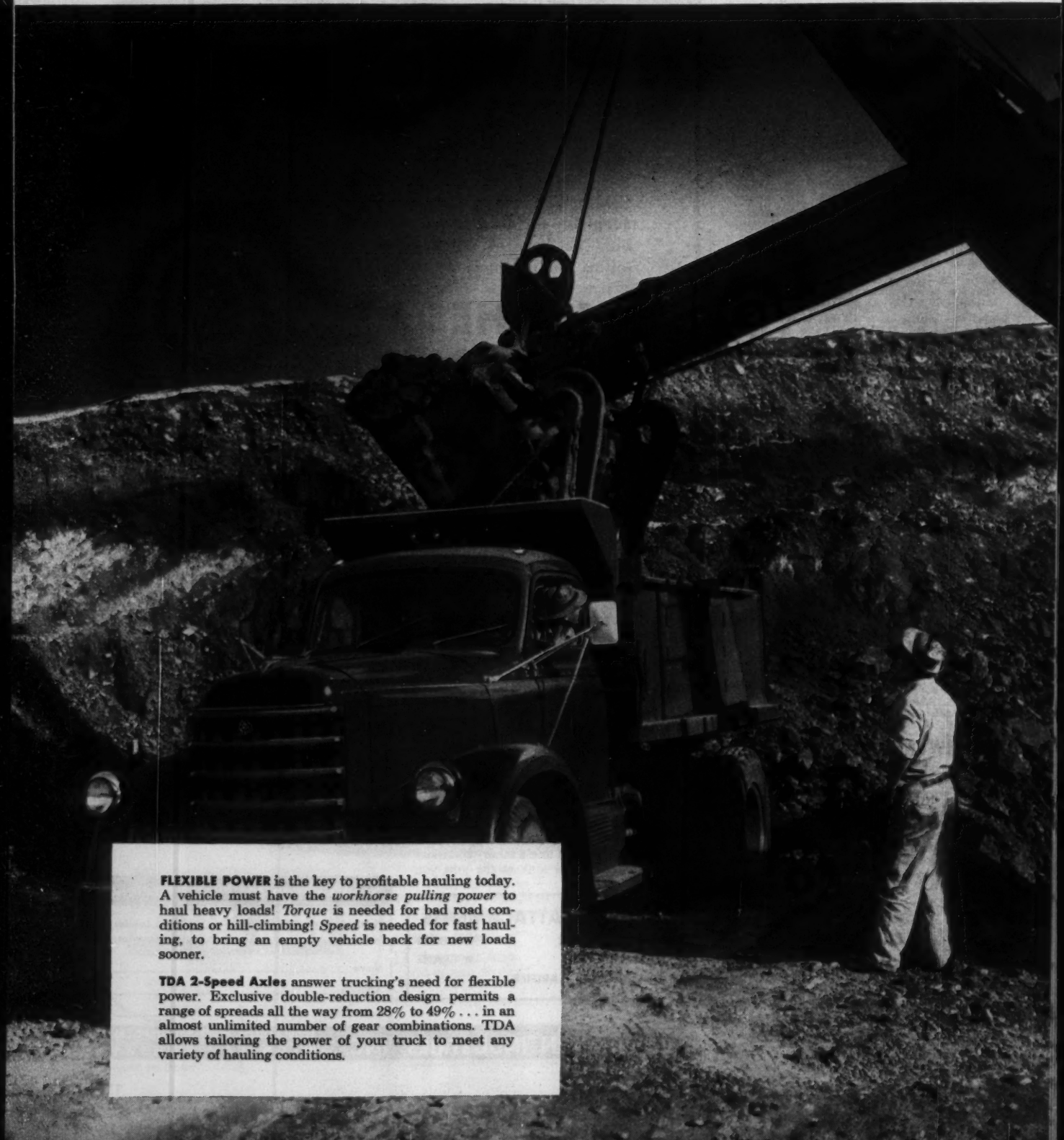
TAILORED POWER



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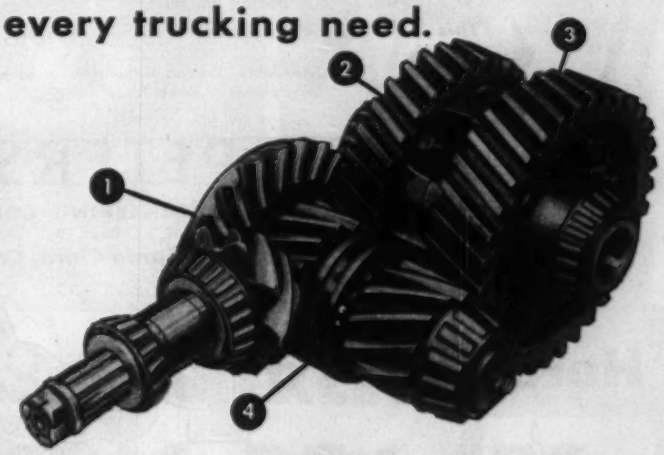
with TDA 2-speed axles

Exclusive, double-reduction design offers almost unlimited possibilities of gear ratios and ratio spreads—this versatility provides tailored power for every trucking need.



How TDA's extra "spread" works to your benefit. *All* 2-speed axles employ an extra set of gears to give two ranges of speed or power to choose from . . . one for *pulling power*, the other for fast speed. Most 2-speed axles offer only one choice of "spread"— 37%. Design limitations prevent changing this standard "spread".

However, TDA uses the exclusive double-reduction design. With TDA, spreads are available all the way from 28% to 49%. This means that your axle can actually be tailored to give you just the power you need. Not only can you specify the spread most suited to your immediate trucking need – but you can easily *change* from one spread to another by merely changing the low speed helical pinion and gear – *an easy mechanical change.*

TDA's more efficient use of engine power gives important benefits . . . high road speeds, faster deliveries, better payload, and maximum fuel economy. No matter what your hauling problem or load/road conditions you save with TDA.

How TDA's 2-Speed principle works! A husky hypoid ring gear and pinion set (No. 1 above) provide the *first step* of the total gear reduction for both fast and slow ratios. Two large, heavy-duty helical gear sets provide the *second step*. Both sets are of balanced size and capacity. One set (No. 2) is for fast speed; the other (No. 3) is for slow speed. The clutch collar (No. 4) power shifts to right or left to engage one helical pinion or the other.

Greater endurance, longer truck life with TDA. TDA's simple design eliminates small complicated parts and midget size gears. Large hypoid-helical design provides more teeth in contact – quieter operation and far less strain. Bearings are larger, too. All this adds up to more profitable operation under all conditions.

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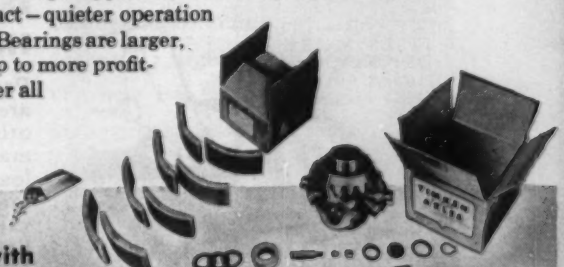

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Take no chances with ordinary replacement parts. For sure, dependable, factory-type jobs, specify genuine Timken-Detroit Axle parts kits—identical to your axles' original equipment.

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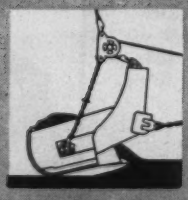
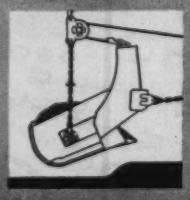
STARTS DIGGING FASTER. First pull on load line causes Bucket to dig in and start loading automatically.



FILLS MORE QUICKLY. Continued pulling loads bucket in only 1½ to 2 lengths.



CARRIES MORE OUT. Automatically assumes balanced carrying position—carries heaped load with minimum spillage.

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Page ENGINEERING COMPANY

Clearing Post Office, Chicago 38, Ill.

(Continued from page 137)

Tex., Houston — HANGAR — Delta-Chicago & Southern Airways, c/o Paul Pete, Houston International Airport, Houston, hangar, Houston International Airport. $400,000.

Tex., Houston — HANGAR — Braniff Airways, A. J. Brough, c/o Houston International Airport, Houston, hangar, Houston International Airport. $375,000.

Tex., Houston—LOADING FINGER—Pan-American Airways, c/o International Airport, Houston, loading finger, Houston International Airport. $350,000.

U. S. POSSESSIONS

Puerto Rico, San Juan—HOSPITAL EXPANSION—Presbyterian Hospital, San Juan, plans Presbyterian Hospital expansion, incl. remodeling and enlarging present facilities, constr. one 3 story modern hospital bldg., and another single floor building with modern facilities, $939,000.

FOREIGN

▲ Africa, Southern Rhodesia—Federal Hydro-Electric Bd. Salisbury, Southern Rhodesia, plans Kariba Gorge Hydro-Electric Proj., 24 units of 74 megawatts capacity; dam will be 400 ft. high, 2,000 ft. long at crest. Total est. cost £85,000,000. Est. cost of dam, £12,000,000. Sir Alexander Gibb & Partners, Queen Anne's Lodge, Westminster, London, S.W. 1, consult. engrs. M. Andre Coyne, 91 Rue St., Lazare, Paris 9, France, designing dam. Merz & McLellan, Consulting Engineers, 32 Victoria St., London S.W. 1, engrs. for electrical installations. CD 7/13.

PUBLIC BUILDINGS

Calif., Arcadia—SCHOOL—Arcadia Unified School Dist., 111 W. Duarte Rd., plans by Leo B. Kline & Boyd Georgi, 1704 Skyview Dr., Altadena, 24 classroom Third Ave. School. $500,000. CD 6/2/53.

▲ Calif., Corona—SCHOOLS—Corona Unified School Dist. of Riverside Co., Corona, $1,775,000 bond election Sept. 27, schools.

Calif., Los Angeles—SCHOOL—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by A. C. Martin & Assocs., 333 S. Beaudry St. San Fernando High School addn., San Fernando. $540,000. CD 6/13/52.

Calif., San Bruno—SCHOOL—San Bruno Park Elementary School Dist., 533 Edlon Ave., plans by Kump Associates, 576 Sacramento St., San Francisco, frame, stucco, Rollingwood School $500,000.

Colo., Ft. Collins—SCHOOL—School Dist. No. 5, Ft. Collins, bond election late September, school building expansion. $700,000.

▲ Conn., Norwalk—SCHOOL—City, Supt. Schools, East Ave., plans by Lyons & Mather, 211 State St., Bridgeport, 2 story Junior High School, Ponus Ave. $1,500,000.

▲ Ga., Albany—HOSPITAL—Georgia State Hospital Bldg. Auth., State Office Bldg., Atlanta, 50-bed Albany General Hospital addn. $1,800,000.

Ga., Atlanta—HEALTH DEPARTMENT—Fulton County Health Dpt., 210 Central Ave. S. W., 3 floor present building addn. $350,000.

Ga., Brunswick — HOSPITAL — Georgia State Hospital Bldg. Auth., State Office Bldg., Atlanta, 50-bed general hospital addn. $600,000.

Ga., Colquit—HOSPITAL—Georgia State Hospital Bldg. Auth., State Office Bldg., Atlanta, 25-bed general hospital, $350,000.

Ga., Homerville—Hospital—Georgia State Hospital Bldg. Auth., State Office Bldg., Atlanta, 25-bed general hospital, $350,000.

Ga., Warm Springs—HOSPITAL—Georgia State Hospital Bldg. Auth., State Office Bldg., Atlanta, 30-bed general hospital, $450,000.

Ill., Blue Island—SCHOOL, etc.—School Dist. 218, c/o 127 and Sacramento St., high school and gymnasium, Crawford and Midlothian Pike, $750,000. Nicol & Nicol, 23 E. Jackson St., Chicago, Zone 4, archts.

Iowa, Algona — SCHOOL — Central Community School Dist., Algona, defeated $450,000 bonds school. CD 9/22/50.

Iowa, Fenton—SCHOOL—Bd. Educ., defeated $450,000 bonds, high school. Haarstick Lundgren & Assoc., N. 212 First Natl. Bank Bldg., St. Paul, Minn., archts. CD 7/1.

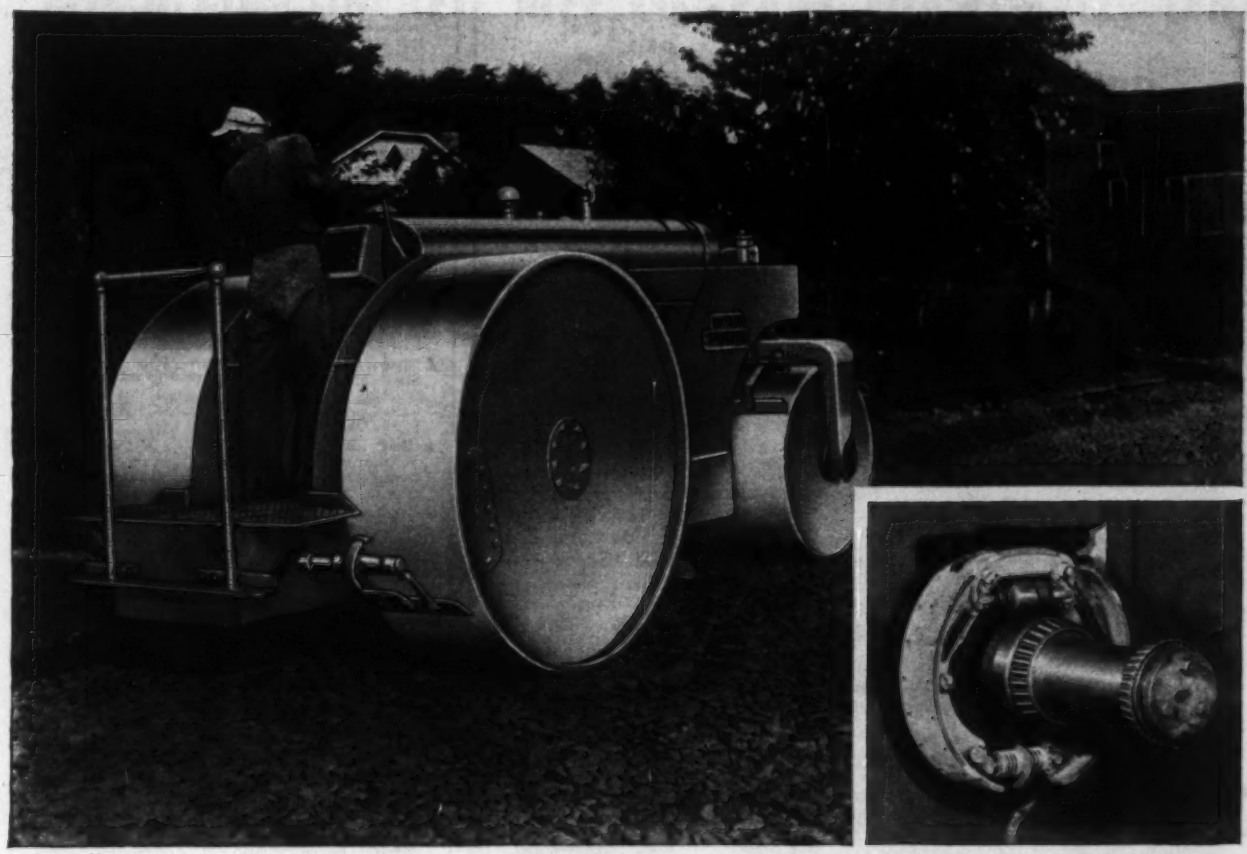
Kan., McPherson—HOSPITAL—McPherson Co., L. Peterson, co. clk., $400,000 bond election Aug. 9, 4 story, 40x40 ft. front addn. and 1 story, laundry, kitchen and heating plant addn. at rear, air-conditioning, remodeling, renovating present McPherson County Hospital. Mann & Co., 201 E. First St., Hutchinson, archts. CD 7/27.

Mass., Arlington—SCHOOL—Town, Marat E. Sintini, chn. School Bldg. Comn., School Dpt., 23 Maple St., plans by Harry J. Horslund, 506 Washington St., Norwood, elementary school, North Union St., East Arlington, $894,000, Goldberg LeMessurier Assoc., 739 Boyleston St., Boston, consult. engrs. CD 11/17.

▲ Mich., Ferndale—SCHOOL—City, Bd. Educ., 130 E. Nine Mile Rd., plans by Jahr & Anderson Associates, Inc., 15011 Michigan Ave., Dearborn, Senior High School, L-shaped site, north of Eight Mile Rd. and west of Pinecrest St., $4,000,000.

▲ Mich., Mount Pleasant—RESIDENCE HALL, etc.—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, residence hall for women, rear of Barnard Hall, $1,200,000; 48-unit residence bldg. for married students, Preston Rd., $450,000; Barnes Hall addnl. wing for men's dormitory, Preston Rd., $400,000, all for Central Michigan College. CD 12/29/52.

(Continued on page 142)



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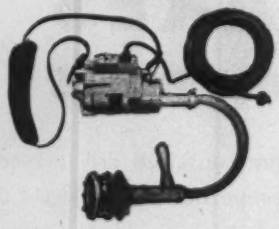

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(Continued from page 140)

▲ **Minn., Anoka** — HOSPITAL BLDGS. — State, Dpt. Admin., A. Naftalin, comr., State Capitol, St. Paul, furnish, install power plant boiler and generator, $290,000, C. Foster & Assoc., 316 Medical Arts Bldg., Duluth, consult. engrs.; plans by Lang & Raugland, 802 Wesley Temple Bldg., Minneapolis, food service bldg., $1,000,000; plans by Bettenburg, Townsend and Stolte, 1437 Marshall Ave., St. Paul, rehabilitation Cottages 1 through 10, $425,000, all at State Hospital.

Minn., Bloomington (P.O. Minneapolis)—SCHOOL—Bd. Educ., A. Moir, clk., $975,000 bond election Aug. 15, grade school, 251 88 St. $900,000, E. D. Corwin, E. 818 First National Bank Bldg., St. Paul, archt. CD 12/9.

▲ **Minn., Faribault**—POWER PLANT, etc.—State, Dpt. Admin., A. Naftalin, comr., State Capitol, St. Paul, power plant rehabilitation at State School, $325,000, Gausman & Moore, First National Bank Bldg., St. Paul, consult. engrs.; plans by Haarstick, Lundgren & Assoc., N. 212 First National Bank Bldg., St. Paul, activities bldg., administration bldg., two 100-bed dormitories, warehouse, $2,000,000.

▲ **Minn., Proctor**—SCHOOL—Bd. Educ., A. I. Jedlicka, supt. Schools, voted $700,000 bonds Junior High School, $700,000, remodel existing high school, Pike Lake Grade School addn., $1,100,000.

▲ **Minn., Rochester**—TREATMENT—State, Dpt. Admin., State Capitol, A. Naftalin, comr., St. Paul, plans by Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, continuous treatment bldg. at State Hospital. $1,250,000.

▲ **Minn., St. Paul**—OFFICE—State, Dpt. Admin., A. Naftalin, comr., State Capitol, plans by Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, state office on capitol grounds. $3,500,000.

Mo., Columbia—SCHOOL—Bd. Educ., Dr. Neil C. Aslin, supt. Schools, $600,000 bond election Sept. 27, Jefferson Junior High School addn.; Lee Elementary School and Senior High School addn. Marshall & Brown, 1016 Baltimore Ave., Kansas City, Mo., archts.

▲† **N. Y., New York**—OFFICE—General Services Admin., P. Bldgs. Service, Ave. F between 18 and 19 Sts., Wash., D. C., 8 story office for U. S. Mission to United Nations area near U.N. Bldg. $3,300,000.

O., Celina—SCHOOL—Bd. Educ., $862,000 bond election Nov. 8, 3 story, 45x62 ft. high school addn., remodel present high school.

▲ **O., Cincinnati**—GARAGE, etc.—City, City Hall, plans by Woodie Garber & Assoc., Wm. Howard Taft Rd., garage, storage depot, pipe yards for Water Works Dpt. on Spring Grove Ave. $2,400,000. Hixon-Tarter, 2320 Victory Parkway, consult. engrs. T. J. Montgomery, city engr. Bids early in 1956. CD 3/2.

▲ **O., Cincinnati** — HOUSING — Cincinnati Metropolitan Housing Auth., Armory Ave., plans by Pepinsky-Grau & Schrand, Union Trust Bldg., apartment, 360 units, row-type houses, Winton Rd. $3,000,000. Larson, McKinney & Miller, 830 Main St., consult. engrs. Ramsey Findlater, Armory Ave., city engr. CD 1/6/50.

O., Dayton—SCHOOL—Bd. Educ., 348 W. First St., plans by William Wertz, Third National Bldg., grade school, Hickorydale Ave. north of Greenwich Village, $550,000. CD 11/12/51.

▲ **O., Salem**—SCHOOL—Bd. Educ., $2,585,000 bond election Nov. 8, Senior High School; convert present high school into Junior High School.

O., Springfield—SCHOOL—Northwestern Local School Dist., c/o Clark Co. Bd. Educ., $570,000 bond election Nov. 8, grade school.

O., Toledo—SCHOOL—Bd. Educ., Wm. E. Hallauer, bus. mgr., Linwood and Southard Sts., Elmhurst School, Elmhurst and Garrison Rds., $445,350.

O., Troy—SCHOOL—Bd. Educ., $2,975,000 bond election Nov. 8, high school, Stannton Rd. west of N. Market St. CD 11/12/47.

O., Willard—SCHOOL—Bd. Educ., City Hall, $526,000 bond election Nov. 8, high school wing, East Side School addn. William B. Huff, 1050 N. Main St., Akron, archt.

Okla., Pawhuska—COURT HOUSE—Osage Co., Pawhuska, bond election Oct. 4 court house addn. $400,000, Fred Zaroor, Muskogee, archt.

Pa., Fallsington—SCHOOL—Bucks Co. Technical Institute, Cornwells Heights, plans by Micklewright & Mountford, Morrisville, vocational school, Fallsington, $500,000. CD 9/16/53.

▲ **S. C., Greenville**—GYMNASIUM—Furman University, Greenville, plans by Perry, Shaw, Hepburn & Dean, 31 St. James Ave., Boston, Mass., gymnasium, incl. admissions offices and R.O.T.C. Unit, $2,000,000. CD 10/13/52.

▲ **Tenn., Nashville**—SCHOOL—David Lipscomb College, Granny White Rd., high school, science, Bible and fine arts buildings. $2,150,000.

Tex., Austin—HOSPITAL WARD—Bd. for Texas State Hospitals & Special Schools, 45 and Lamar Sts., plans by Page, Southerland & Page, 602 West Ave., women's ward bldg. $900,000. CD 12/28/50.

Tex., Center Point—SCHOOL—Center Point Independent School Dist., plans by Addis E. Noonan Assocs., 803 Am. Hospital & Life Bldg., San Antonio, elementary school. $350,000.

Tex., College Station—DAIRY BIOCHEMISTRY, etc.—A & M College of Texas, College Station plans by Adams & Adams, Box 283, Terrell Wells, 3 story dairy biochemistry bldg. and 1 story creamery bldg. $500,000.

Tex., Floyada—SCHOOL—Floyada Independent School Dist., voted bonds high school $400,000. CD 7/8.

(Continued on page 144)

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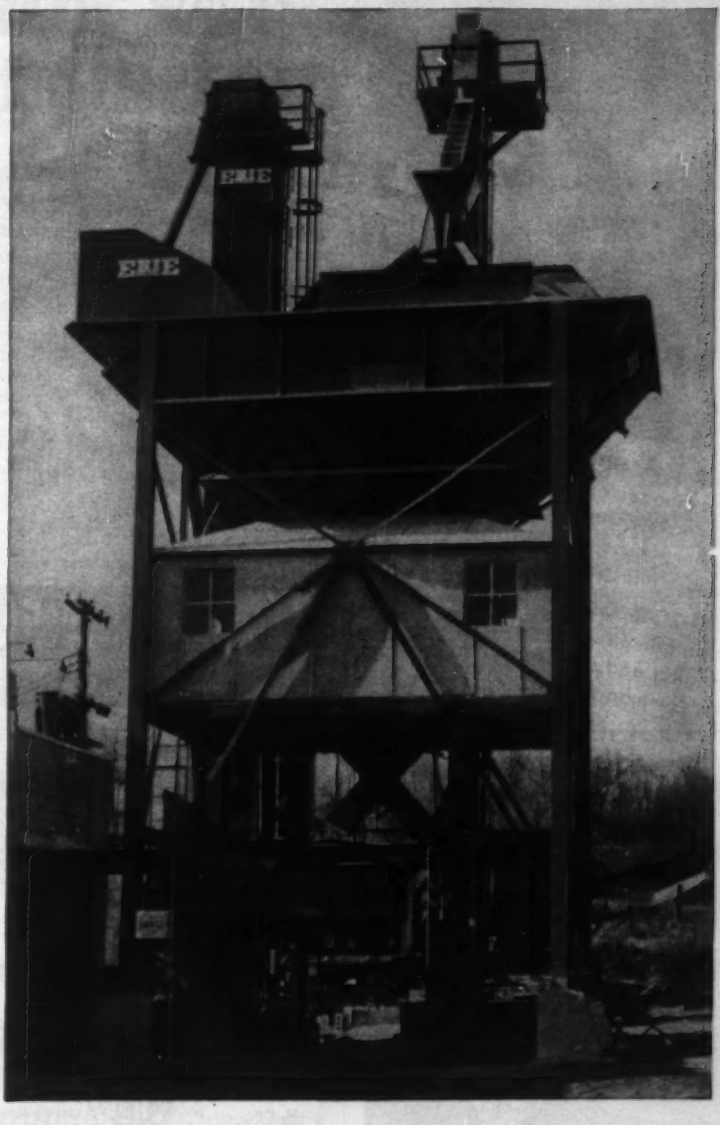

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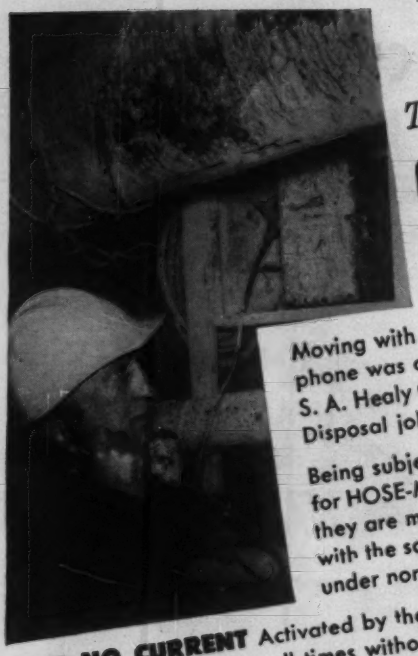

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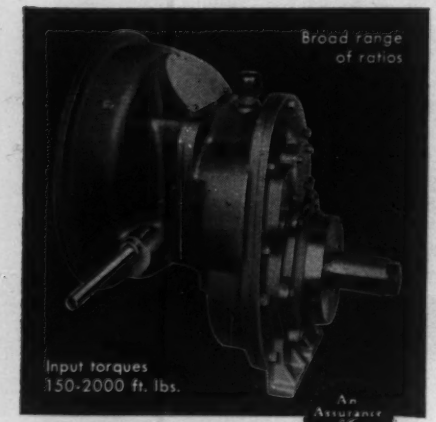

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(Continued from page 142)

Tex., Garciasville and LaGrulla—SCHOOLS—Rio Grande Consolidated Independent School Dist., E. A. Duran, pres., Rio Grande City, plans by Ralph H. Cameron, 1519 Transit Tower, San Antonio, (1) La Union School in Garciasville and (2) LaGrulla Elementary School, masonry constr. $365,000.

Tex., Kingsville—DORMITORY—Texas College of Arts & Industries, Kingsville, plans by Jessen, Jessen, Milkhouse & Greeven, 2816 Hemphill Park, Austin, girls' dormitory, $350,000. Blum & Guerrero, 4930 Maple St., Dallas, and W. E. Simpson Co., 945 Milam Bldg., San Antonio, consult. engrs. CD 5/31.

Tex., Merkel—GYMNASIUM—Merkel Independent School Dist., Merkel, gymnasium addn., auditorium addn., remodeling high school. $350,000.

Tex., San Antonio—WAREHOUSE—The Stewart Co., 1401 S. Flores St., plans by Bartlett Cocke, 3501 Broadway, warehouse, 10-acre tract. $350,000. CD 4/1.

▲ Tex., Victoria—SCHOOLS—Victoria Independent School Dist., Victoria, bond election Sept. 27, F. W. Gross High School addn. $375,000; Senior High School $2,000,000; Guadalupe Elementary School $350,000; Lone Tree Elementary School $365,000; Crescent Valley Elementary School $375,000; converting Patti Welder High School into Junior High School $400,000; utilities lines, $135,000. CD 12/28.

▲† Va., Richmond—FEDERAL OFFICE—General Services Admin., General Service Bldg., Ave. F between 18 and 19 Sts. N.W., Wash., D. C., federal office building. $7,410,000.

▲† Vt., Burlington—COURTHOUSE, etc.—General Services Admin., General Service Bldg., Ave. F between 18 and 19 Sts. N.W., Wash., D. C., courthouse and federal bldg. $2,830,000.

Wash., Mount Vernon—HOSPITAL—Skagit Co. Hospital District, Mount Vernon, bond election Sept. 30, hospital, $850,000. J. W. Maloney, Central Bldg., Seattle, Zone 4, archt. CD 11/10, under Commercial Buildings.

▲ Wis., Delavan—SCHOOL—Delavan-Darien High School Bd., 312 Wisconsin St., plans by John J. Flad & Assocs., 2525 University Ave., Madison, high school, $1,000,000.

▲ N. B., Fredericton—ART GALLERY—City, City Hall, plans by Stewart & Howell, 86 York St., 1 story bsmnt., 75x120 ft., steel art gallery, Queen St. $1,000,000.

▲ Ont., Ottawa—HOUSING—Central Mortgage & Housing Corp., Montreal Rd., 400-housing units on Base Line Road, western part of city, $5,000,000. CD 11/13/50.

Ont., Smith Falls—HOSPITAL WING—Smiths Falls (Chambes Memorial), Public Hospital, 20 Daniel St., plans by Drever & Smith, 81 Brock St., Hamilton new wing across front of existing hospital, $360,000.

Que., Montreal—SCHOOL—Montreal Catholic School Comn., 117 St. Catherine St. W., plans by Gaeton Le Borgne, c/o owner, ch. archt., 16-classroom school, Favard St. Commercial Buildings St. Jean L'Evenageliste Parish, $500,000-$600,000.

COMMERCIAL BUILDINGS

Calif., Canoga Park—DWELLINGS—Glick Bros., 8423 S. Alameda St., plans by L. C. Major & Assoc., 8803 Melrose Ave., Los Angeles, 64 frame, stucco dwellings in Canoga Park, $600,000.

▲ Calif., Compton — SCHOOLS — Compton Elementary School Dist., 604 S. Tamarind St., $1,800,000 bond election Oct. 21, schools.

▲ Calif., Cucamonga — HOMES — Devon Homes, c/o Pierre Woodman, 208 S. Laurel Ave., Ontario, 118 Frame, stucco homes, $1,200,000.

Calif., Los Angeles—DWELLINGS—Karasik Development Co., 12033 Kling St., North Hollywood, plans by L. C. Major & Assoc., 8803 Melrose Ave., 49 frame, stucco dwellings, Van Nuys Dist. $470,000.

Calif., Los Angeles—DWELLINGS—Zolla-Barzaw, 1333 S. Ogden Dr., plans by L. C. Major & Assoc., 8803 Melrose Ave., 50 frame, stucco dwellings in Van Nuys Dist. $500,000.

Calif., Los Angeles—DWELLINGS—Victoria Enterprises Inc., 356 S. Sepulveda Blvd., Manhattan Beach, 72 frame, stucco dwellings, Oakdale, Bryant and Lubac Sts. $750,000.

Calif., Orange—DWELLINGS—Hornier Toberman, 6763 Hollywood Blvd., plans by L. C. Major & Assoc., 8803 Melrose Ave., Los Angeles, 40 frame, stucco dwellings. $400,000.

Calif., Orange—DWELLINGS—Empire Builders, 8440 Melrose Pl., plans by L. C. Major & Assoc., 8803 Melrose Ave., Los Angeles, 73 frame, stucco dwellings, 226th and Main Sts. $750,000.

Calif., Rialto—DWELLINGS—Fred Dowd & Assoc., Box 121, Fontana, plans by L. C. Major & Assoc., 8803 Melrose Ave., Los Angeles, 86 frame, stucco dwellings. $850,000.

▲ Calif., San Rafael—HOMES—Maury Phillips, 1034 B St., 44 home subdivision. $1,100,000. Dan Coleman, 145 Natoma St., San Francisco, consult. engr.

▲ Calif., San Rafael—HOME—Harry Heifetz, 2020 A. 4 St., San Rafael, plans by Robert Marquis & Assocs., 802 Montgomery St., San Francisco, 71 home subdivision. $1,704,000. Wilsey & Ham, Box 144, consult. engrs.

Calif., Torrance—DWELLINGS—HAAS Land Co., 7862 S. Western Ave., 57 frame, stucco dwellings, Graverly Ave. and 156 St. $500,000.

Calif., Walnut Creek—MOTEL-HOTEL—Doyle Motel, 1638 N. Main St., motel-hotel, incl. swimming pool. $600,000.

(Continued on next page)

▲ **Colo., Aurora**—RESIDENTIAL and INDUSTRIAL DEVELOPMENT—Morris Brothers Constr. Co., 4390 W. 17 St., Denver, residential and industrial development, shopping center and 18-hole golf course. $50,000,000.

Colo., Denver—CHURCH—Grace Lutheran Church, East Ave. and Birch St., plans by Baume & Polivnick, consult. engrs. & archts., 1225 Bannock St., church to seat 600, 4 classroom school. $350,000.

▲ **Colo., Grand Junction**—HOTEL and OFFICE—Stephen G. Pappas & Henry A. Winter, Jr., 2001 Blake St., Denver, plans by Jay Johnson, archt.-consult. engr., 360 Reed Ave., remodeling old hospital into hotel and office bldg. $3,500,000.

▲ **Ill., Chicago**—APARTMENTS—Owner, c/o Kornacker & Assocs., archts., 53 W. Jackson St., Zone 4, 5 story apartment, 10500 S. Walden St. $1,000,000.

Ind., Anderson — OFFICE — United Auto Workers CIO Local 622, 16 E. 12 St., union home and office bldg., east of city along White River on Ind. 109. $375,000.

Iowa, Des Moines—SUPERMARKET—Hinky-Dinky Food Stores, 11 and Jones Sts., Omaha, Neb., supermarket branch retail food store, Beaver and Douglas Sts., imprv. parking lot. $375,000.

Iowa, Fort Dodge—HOSPITAL—Lutheran Hospital, c/o supt., Lutheran Park Rd., Fort Dodge, plans by The Griffith Co., M 31, Warder Bldg., Fort Dodge, psychiatric hospital, $350,000. Earl Beling, 2428 13 St., Moline, Ill., consult. engr. CD 3/17.

▲ **Minn., Bloomington** (Minneapolis P. O.)—SHOPPING CENTER, etc.—A. E. Ellis, 1835 E. 86 St., Minneapolis, plans by H. E. McClure, 621 W. Lake St., Minneapolis, shopping center and night club near 78 St. and Cedar Ave., $2,000,000.

▲ **Minn., St. Paul**—SHOPPING CENTER, etc.—Sunray Corporation & Associates, M. Welch, pres., 5009 Excelsior Blvd., St. Louis Park, plans by Murray Brothers, St. Louis Park, Sunray Shopping Center and housing, incl. 100 stores, 246 houses, Hy. 12 and East Ave. $5,000,000.

▲ **Minn., St. Paul** — HOSPITAL — Children's Hospital, Inc., Mrs. W. H. Lang, treas., Bd. Trustees, 311 Pleasant Ave., plans by C. H. Johnston, 715 Empire Bank Bldg., 7 story hospital addn. $1,250,000.

▲ **Mo., Clayton** (St. Louis 5 P.O.)—HOTEL—Bernard Corp., c/o Bernard F. McMahon, archt., 101 S. Meramec Ave., Zone 5, 7 story hotel, outdoor swimming pool, adjacent parking facilities on 2-acre site between Bonhomme and Carondelet Aves., $1,500,000.

▲ **Neb., Omaha**—OFFICE—Guarantee Mutual Life Insurance Co., 18th and Douglas Sts., office building, West Dodge St. in Indian Hills area just outside city limits. $1,300,000. L. A. Daly Co., Insurance Bldg., consult. engr.

▲ **N. Y., Elmhurst**—APARTMENT—Lefrak Organization, 97-27 64 Rd., Forest Hills, apartment, on tract on 80 St. near Broadway. $4,000,000.

N. Y., Elmhurst—APARTMENT—Universal Leasing Corp., c/o Schulman & Soloway, archts., 100-15 Queens Blvd., Forest Hills, 6 story apartment, 62 Drive, east of 108 St. $448,000.

N. Y., New York—APARTMENT—80 Bennett Ave. Corp., 1505 Townsend Ave., Zone 52, plans by H. Herbert Lilien, 201 W. 72 St., Zone 23, apartment, 80-88 Bennett Ave. $430,000.

▲ **N. Y., New York**—APARTMENT—Commodore Constr. Co., Inc., 7 E. 42d St., Zone 17, plans by Richard Roth, 575 Madison Ave., Zone 22, 8 story apartment, 4425 Post Rd. $1,385,000.

▲ **N. Y., New York**—APARTMENT—Revere Hall, Inc., 910 Sheridan Ave., plans by William I. Hohauser, 151 W. 51 St., Zone 19, 16 story apartment, 1453-1551 Second Ave. and 241-347 E. 80 St. $1,300,000.

▲ **N. Y., New York**—APARTMENT—Landed Estates, Inc., 26 Court St., Brooklyn, Zone 1, plans by Sylvan Bien, 33 W. 46 St., Zone 19, 19 story apartment, 351-357 E. 57 St. $1,200,000.

▲ **N. Y., New York**—APARTMENT—Sam & Irving Rosoff, 369 Lexington Ave., Zone 17, plans by George G. Miller, 125 W. 45 St., Zone 19, apartment, 211-229 E. 18 St. $1,000,000.

O., Ashland—DORMITORY—Ashland College, Ashland, women's dormitory. $400,000.

▲ **O., Cleveland**—OFFICE—55 Public Square Building Co., Inc., c/o Ostendorf-Morris Co., Public Square Bldg., plans by Carson & Lundin, 50 Rockefeller Plaza, New York, N. Y., 22 story office, northwest corner Public Square, for occupancy by Cleveland Electric Illuminating Co., 75 Public Square Bldg., Cleveland, O. $17,000,000. McGeorge-Hargett & Assoc., 7016 Euclid Ave., engrs.

▲ **O., Cleveland**—HOTEL and OFFICE—Louis F. Kramer, 1583 Chesterland Ave., Lakewood, Zone 7, plans by Naess & Murphy, 80 E. Jackson St., Chicago, Ill., 20 story hotel and office, Prospect Ave. N. W., incl. open five deck parking bldg., also proposed garage westward on Huron Rd. $45,000,000. Beiswenger & Hoch, 661 W. Market St., Akron, engrs.

Pa., Phila.—CHURCH—Episcopal Church of the Redemption, 19 N. 56 St., rebuild church, $350,000.

▲ **Tex., Abilene**—SHOPPING CENTER—Owner, c/o Darrell, Walling & Associates, archts., 2205 W. Holcombe St., Houston, shopping center, off N. Mockingbird Lane. $1,000,000.

▲ **Tex., Arlington**—DWELLINGS—M. C. Andrews, Jr., 320 S.E. 9th St., Grand Prairie, 20 brick veneer dwellings, $348,850; 32 brick veneer dwellings, $371,875; 30 brick veneer dwellings, $389,400; 24 all Redwood dwellings, $360,000; 32 all-Redwood dwellings, $396,500; 28 all-Redwood dwellings, $373,385; 26 all-Redwood dwellings, $368,190, in "Hillcrest Park" subdivision.

(Continued on next page)

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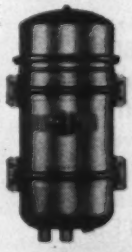

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▲ **Tex., Beaumont**—STORE—Finger Furniture Co., c/o San Finger, 3131 Calhoun Rd., Houston, mercantile and merchandising store, 25-acre site near Hy. 90. $1,500,000.

▲ **Tex., Bryan** — GYMNASIUM, etc. — Allen Military Academy, Bryan, plans by Wyatt C. Hedrick, consult. engr.-archt., 5201 Fannin St., Houston, gymnasium, $350,000; classrooms, $750,000; dormitory and mess, $1,000,000; equipment storage and warehousing, $200,000; heating plant, $150,000; sanitary sewers, sys. imprvs., $85,000; storm sewers, open drainage, $75,000; water works, $60,000; school area paving, $90,000. CD 3/30.

Tex., Dallas—DWELLINGS—B. F. Davis, Jr., 5622 Dwyer St., 30 brick veneer dwellings. $350,000.

▲ **Tex., Dallas**—DWELLINGS—Keele-Jones Constr. Co., 2911 S. Lancaster St., Dallas, (h) 22 brick dwellings, $348,175, (i) 26 brick, stone dwellings, $368,600; 35 frame, asb. siding dwellings, $375,000; 30 frame, brick trim dwellings, $358,700, in northeastern section of city.

▲ **Tex., Grand Prairie**—DWELLINGS—Centex Constr. Co., 4606 Greenville St., Dallas, Group 32, 30 dwellings, $370,065; Group 33, 29 dwellings, $361,185; Group 34, 25 dwellings, $353,910; Group 35, 33 dwellings, $381,050; Group 36, 23 dwellings, $345,000; Group 37, 36 dwellings $393,700; Group 38, 38 dwellings, $409,600, in 518-acre tract south of city limits.

▲ **Tex., Grand Prairie**—SHOPPING CENTER—Inglewood Park Shopping Center, Grand Prairie, masonry, steel type shopping center, off Belt Line Rd. $1,000,000.

▲ **Tex., Houston**—DWELLINGS—Canterbury Village, Valentine Land Co., c/o John Wheat, Bank Commerce Bldg., Houston, 21 dwellings, $345,450; 45 dwellings $415,700; 40 dwellings, $382,265; 38 dwellings, $376,185; 25 dwellings, $351,000; 28 dwellings $359,875; 32 dwellings, $365,000; 36 dwellings $369,180; 41 dwellings, $391,690, in Canterbury Village.

Tex., Odessa—OFFICE—GOBSC, Odessa, plans by Taylor & Devlin, 3004 N. Jacobson St., masonry office, $875,000.

▲ **Tex., Tyler**—SHOPPING CENTER—A. E. Dennis & W. E. Curtis, Tyler, plans by Carl Gregory, Box 763, 1 story, masonry shopping center, incl. refrigeration rooms, $1,250,000.

Tex., Waco—MOTEL—Dwight Parks Enterprises, 1825 Austin St., plans by Rob. E. Bennett, 1825 Austin Ave., 1 story, 60-unit, masonry motel, $350,000.

▲ **Wash., Seattle**—OFFICE—University Properties Inc., Cobb Bldg., Zone 1, 20-story office on site of Douglas Bldg., 4 and Union Sts. $3,000,000.

▲ **Ont., Windsor**—HOUSING—Westchester Developments Ltd., 601 Canada Trust Bldg., Windsor, 400 home housing program in suburban Riverside on Riverside Dr. $3,600,000. C. G. R. Armstrong, 605-606 Bartlett Bldg., consult. engr.

▲ **Que., Montreal**—COLLEGE—St. Jean de Brebeuf College, 3200 Cote St. Catherine Rd., plans by Brais & Savard, 7084 St. Denis St., and Bernard Depatie, 6879 St. Lawrence Blvd., college additions. $2,000,000. CD 2/1.

▲ **Puerto Rico, San Juan**—HOTEL—Caribe Hilton Hotel Corp., San Juan, plans by Toro & Ferrer, Monserrate St., 560 Saturce, Puerto Rico, 7 story, rein.-con., 100-room first class hotel annex, $1,200,000.

INDUSTRIAL BUILDINGS

Ala., Birmingham—TERMINAL—Gordon Transports, Inc., 3501 5 Ave. N., motor freight terminal. $124,759.

Conn., Bloomfield—FACTORY—G. M. Ney Co., William P. Conklin, pres., 71 Elm St., Hartford, factory, 10 acre tract west of Blue Hill Ave. $100,000.

▲ **Ga., Ellijay**—PLANT—Davenport Hosiery Mills, Inc., 116 E. 9 St., Chattanooga, Tenn., stocking plant. $1,000,000.

▲ **Ga., Savannah**—GRAIN ELEVATOR—Georgia Grain Elevator Co., Volunteer Bldg., Atlanta, 750,000-bu. grain elevator, $2,000,000.

Ga., Young Harris—PLANT—Brumby Knitting Mills, Inc., Murphy, N. C., mfg. plant, $100,000.

Kan., Kansas City—FACTORY—Charles W. MacManis, 1903 N. 10 St., plans by D. D. Fairhurst, 1016 Baltimore St., Kansas City, Mo., factory addn., $125,000.

▲ **Ky., Owensboro**—PLANT, etc.—General Electric Co., River Rd., Schenectady, N. Y., plans by Lennox & Matthews, 648 E. 38 St., Indianapolis, Ind., 1 story 200x500 ft. electronic tube mfg. plant and warehouse, $1,250,000.

Mass., Agawam—TRUCK TERMINAL—Michael W. Albano, 1214 Main St., Springfield, truck terminal, $150,000, Munson & Mallis, 121 Chestnut St., Springfield, designers.

Mass., Dalton—FACTORY—Crane & Co., South St., plans by Prentice Bradley, 74 North St., Pittsfield, factory addn. $100,000.

▲ **Minn., St. Paul**—INDUSTRIAL CENTER—M. Capp Mfg. Co., 1143 Dupont Ave. N., Minneapolis, "Midway Industrial Center" providing warehousing, distributing and light mfg. facilities, 30,000 sq. ft. bldgs., on Vandalia St., 3 blocks north of University Ave. $3,000,000.

Mo., Kansas City—WAREHOUSE—F. S. Edwards Tobacco Co., 837 Minnesota St., Kansas City, Kan., plans by Charles Keyser, 609 Minnesota St., Kansas City, Kan., warehouse, $120,000.

(Continued on page 148)

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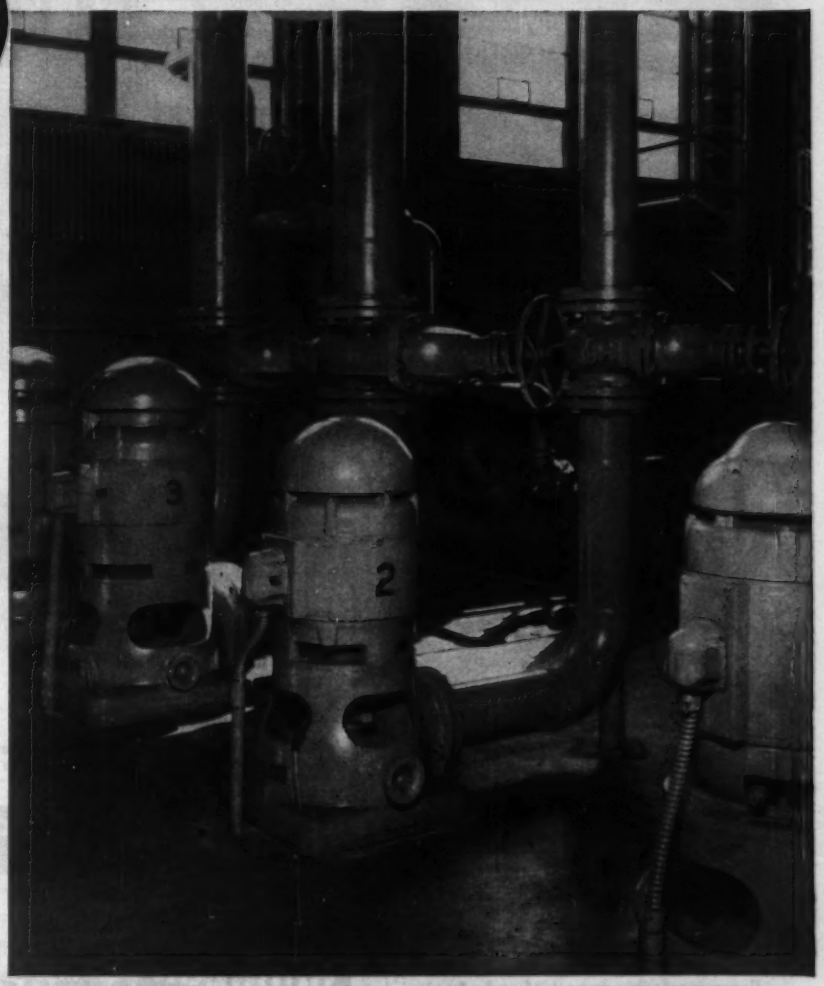

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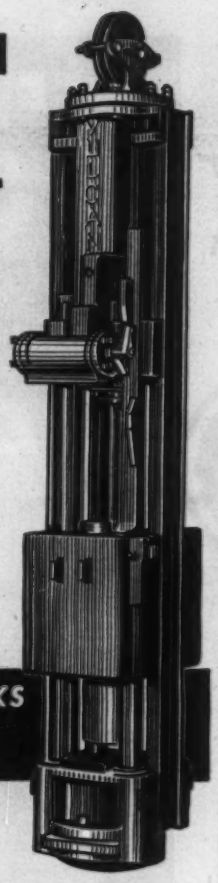

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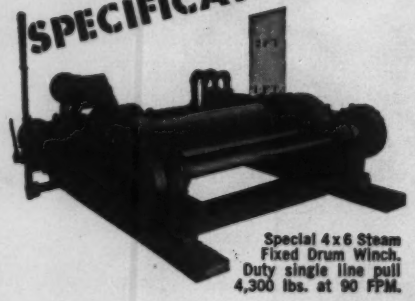

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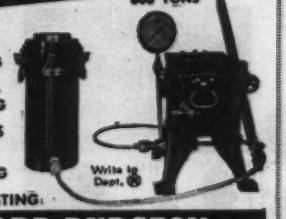

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(Continued from page 146)

▲ **Mo., St. Louis**—INDUSTRIAL AREA—Conduit Industrial Redevelopment Corp., c/o G. J. Nooney & Co., Shell Bldg., 1221 Locust St., Zone 3, development of industrial area, incl. bldgs., street imprvs., addnl. water and sewer lines, etc. on 280 acre tract between East Grand Ave., Hall St., Taylor Ave. and C. B. & Q. R.R. tracks. $1,000,000.

Okla., Oklahoma City—PLANT—Aero Design & Eng. Co., expansion of air plane manufacturing plant 50th and Council Rd. $400,000, R. J. Amis, Jr. c/o owner engr.

▲ **Pa., Pittsburgh**—GARAGE—Equitable Life Assurance Society, 393 Seventh Ave., New York, N. Y., plans by Schell Deeter & Stott, 1112 Clark Bldg., concrete, steel underground parking garage, $1,500,000. CD 1/5.

▲ **S. C., Aiken**—PLANT—Marine Minerals, Inc., Aiken, development of rutile and ilmenite, $1,142,500.

Tex., Beaumont—WAREHOUSE—Finger Furniture Co., c/o Sam Finger, 3131 Calhoun Rd., Houston, 49,000 sq. ft. warehouse, 25-acre site near Hy. 90, $450,000.

W. Va., Fairmont — PLANT — Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, Pa., plans by Peter Loftus Corp., 813 First Natl Bank Bldg., Pittsburgh, Pa., 2 story, 140x150 ft., steel, brick, block lamp plant addn. $250,000. CD 7/29/52.

N. B., Moncton—PLANT—Commercial Equipment Ltd., 115 Foundry St., new plant buildings in Foundry and Cable Sts. area, $300,000.

Puerto Rico, Caguas—INDUSTRIAL—Puerto Rico Industrial Development Co., San Juan, two typical industrial bldgs. $105,477.

UNCLASSIFIED

Alabama—RAILROAD MAIN LINE TRACKAGE—Southern Ry. Sys., G. H. Echols, ch. engr., P. O. Box 1808, Wash. 13, D. C., relocating railroad mainline trackage in Muscadine, $203,100.

▲ **Colorado**—RURAL DISTRIBUTION LINES—Intermountain Rural Electric Assoc., Littleton, 498 mi. rural distr. line, two sub-stations, Jefferson Co., $1,035,000.

Ga., Atlanta—TELEVISION STUDIO—Protestant Radio Center, 1805 Clifton Rd. N. E., television production studio $250,000.

Kentucky—RURAL DISTRIBUTION LINES—Big Sandy Rural Electric Co-op. Corp., Paintsville, 13 mi. rural distr. lines, sys. imprvs., Floyd Co., $145,000. CD 9/4/47.

Mich., Oak Park—SWIMMING POOL—City, Louis Shaw, clk., plans by Bery-Klei & Assoc., 8440 Nine Mile Rd., indoor-outdoor swimming pools, $160,000. CD 4/13.

Mo., Columbia—PARK—Boone Co., Columbia, defeated $300,000 bonds July 12, development of Deer Park recreation near here. CD 6/23.

Montana—RURAL DISTRIBUTION LINES—Yellowstone Valley Electric Co-operative, Huntley, 32 mi. rural distr. lines, 27 mi. 50 KV transmission line, sys. imprvs., McCone Co. $350,000.

Nebraska—RURAL DISTRIBUTION LINES—La Creek Electrical Assn., Martin, S. D., constr. 164.9 mi. distribution lines. $125,000. Schott Eng. Co., Watertown, S. D., engr.

▲ **O., Cleveland**—LAKEFRONT DEVELOPMENT—City, City Hall, Zone 14, $8,000,000 bond election Nov. 8, lakefront development and imprv., Wm. J. Rogers, City Hall, dir. Dpt. Port Control. CD 5/21/54.

O., Whitehall—SWIMMING POOL, etc.—Whitehall Swimming Pool & Recreation Club, Inc., c/o Jas. R. Barnes, 193 Little Flower Lane, 84x168 ft. swimming pool bath house, bleachers for seating, wading pool, Hamilton Rd. just north of Etna Rd. $150,000.

▲ **Okla., Oklahoma City**—TRAFFIC WAYS—City, traffic ways, $5,000,000, W. W. Baker, City Hall, engr.

Oregon—RURAL DISTRIBUTION LINES—Columbia Power Co-operative Assoc., Monument, 50 mi. rural distr. lines, sys. imprvs., Wheeler Co., $151,000.

Pa., Phila.—ATHLETIC FIELD, etc.—Bd. Educ., 21 and Winter Sts., plans by Davis Poole & Sloan, 112 16 St., athletic field and field house, Broad St., Ogontz Ave., etc. $400,000. Bids early in September. CD 2/3/47.

▲ **Texas and Oklahoma**—MICROWAVE RADIO COMMUNICATIONS SYSTEM—Continental Pipe Line, c/o Sterling Bldg., and Sinclair Pipe Line Co., Gulf Bldg., Houston, microwave radio communications system transmitters at 40-mi. intervals along the line from Houston, Tex. to Ponca City, Okla. $1,000,000.

Texas—PIPE LINES—Sinclair Pipe Line Co., Gulf Bldg., Houston, some pipe lines in Sour Lake, Hardin Co., area. $300,000.

Tex., Alpine—RODEO ARENA—Sul Ross College, Alpine, plans by Victor J. Smith, 906 E. Ave. D, Alpine, rodeo arena, incl. 135x270 ft. arena, seating, fencing, pens, gates and chutes, $200,000.

Tex., Atlanta—RESORT LODGE, etc.—Texas State Parks Bd., 1406 Colorado St., Austin, plans by Reinheimer & Cox, 411 Texas Natl. Bank Bldg., Texarkana, resort lodge and facilities, Atlanta State Park on Texarkana Reservoir, $750,000. CD 12/27.

Tex., Bryan—POWER SYSTEM—City, municipal power sys. $750,000. Lutz & May, Bryan, consult. engrs.

▲ **Wash., Moses Lake**—GAS DISTRIBUTION SYSTEM—Columbia Basin Natural Gas Co., Inc., Box 1525, natural gas distr. sys. $1,000,000.

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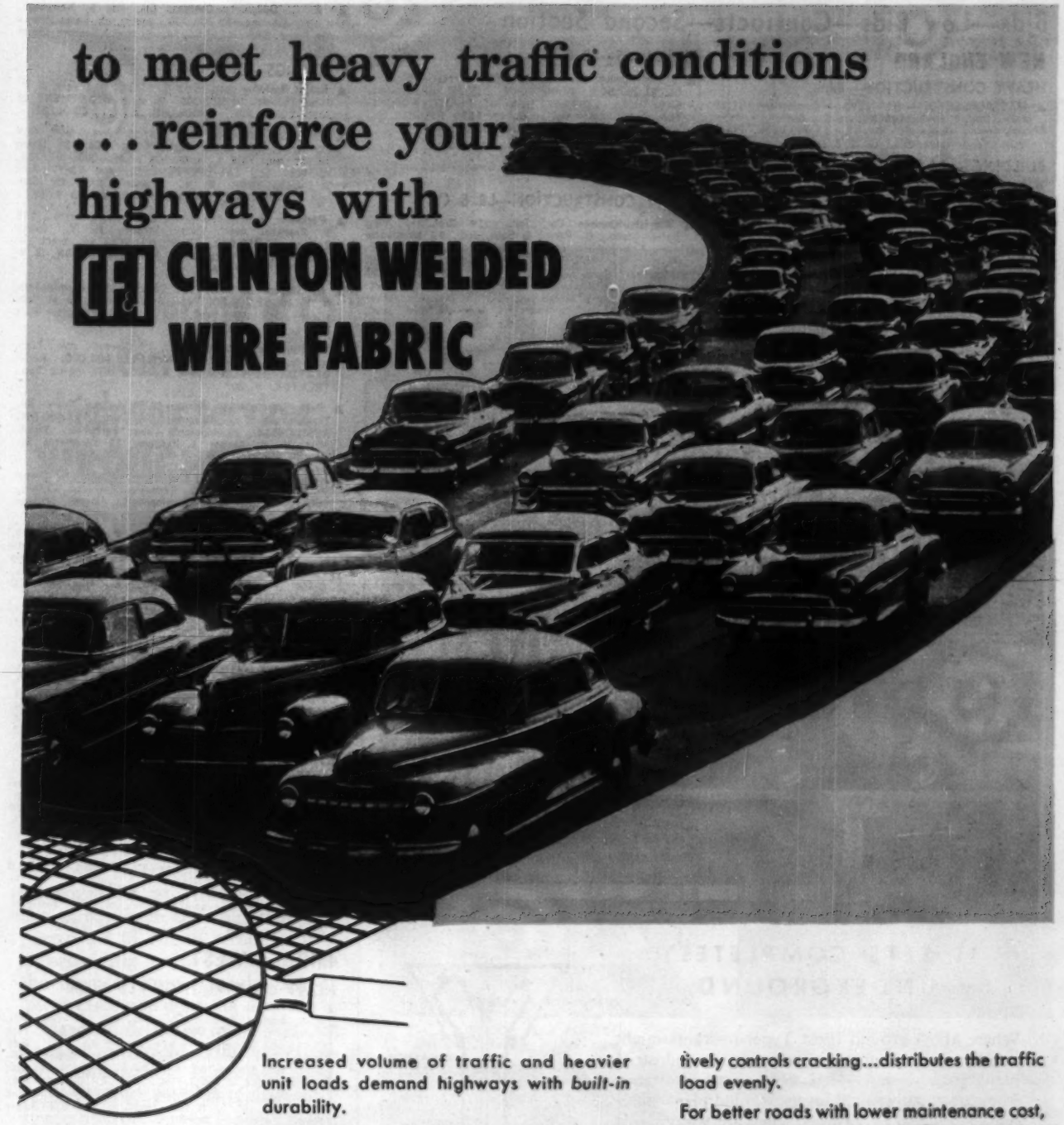

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NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ **MASSACHUSETTS** — BA 8/23 — Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, **Plymouth**—hy. relocation Rte. 3, $3,000,000. Plans deposit $25, refundable. CD 2/2/54.

BUILDINGS—BA

▲ **Mass., Taunton** — ADMISSIONS TREATMENT — BA 8/19—State, Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, P-M 26 Contr. 1, admissions treatment bldg., State Hospital, $2,000,000. Plans deposit $100, refundable. Cram & Ferguson, 248 Boylston St., Boston, archts. CD 7/14/54.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston,
V. Barletta Co., 10 Whipple Ave., Roslindale, Mass. CA $1,855,195, est. $1,853,000. William T. Morrisey Blvd., Neponset River Bridge to Tolman St., Boston. CD 7/26, under LB.

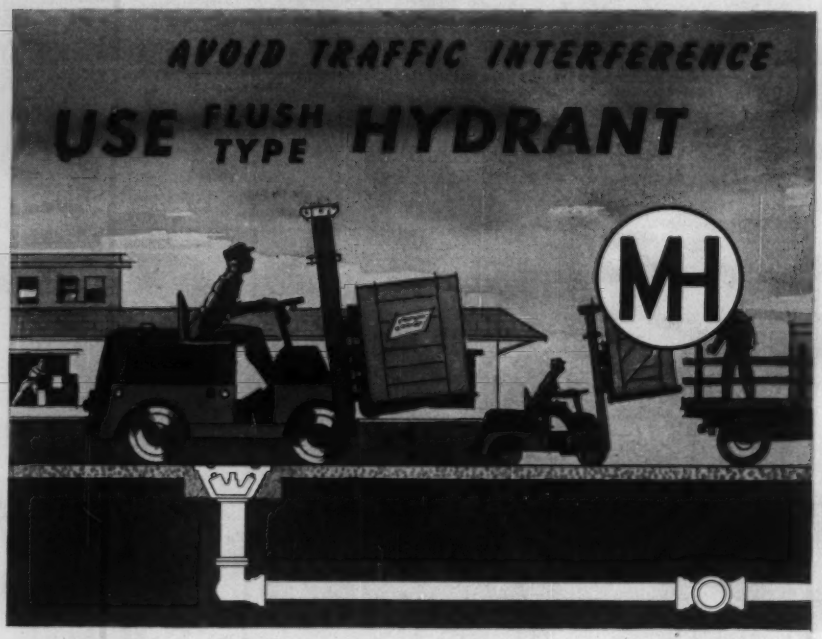
BUILDINGS—LB & CA

▲ **Granger Contg. Co.**, 306 Main St., Worcester 8, Mass. CA $1,267,500. DORMITORY, DINING HALL, SCIENCE HALL, LIBRARY, HEATING PLANT, WORCESTER, MASS. Assumption College, 670 Hamilton St., Worcester, Mass. Bids July 29. CD 7/11.

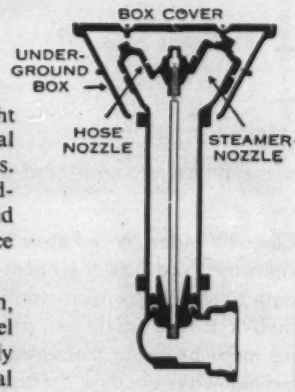
MIDDLE ATLANTIC

HEAVY CONSTRUCTION—LB & CA

▲ **Morrison-Knudsen Co., Inc.**, 319 Broadway Ave., Boise, Idaho, **B. Perini & Sons, Inc.**, 73 Montwaite Ave., Framingham, Mass., **Walsh Constr. Co.**, 122 E. 42 St., New York, N. Y., **Utah Constr. Co.**, 144 E. Broadway, Salt Lake City, Utah. LB $7,824,133 (concrete and portland cement) LB $7,861,633 (portland and natural cement) (5 bidders) Massena Intake near Massena St. Lawrence County, New York, Spec. No. PA-5-11004, St. Lawrence Contr. No. 16, NEW YORK, Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. Bids Aug. 2. CD 7/11.



IT SETS COMPLETELY UNDERGROUND



Where above-ground (Post Type) hydrants might interfere with traffic or operations in industrial plant areas, install M&H Flush Type Hydrants. They are equally suited for use around plant buildings, terminals, or airfields. They are widely used at airports where non-interference with surface traffic is a necessity.

The cast iron box, housing the nozzle section, sets flush with the ground level. The two-piece steel box cover is extra heavy and strong, is quickly lifted when access to the hydrant is desired. Internal construction of the hydrant is exactly the same as standard M&H fire hydrants, widely used by municipalities throughout the United States. For complete details, wire or write

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▲† **A. L. Dougherty Overseas Co.**, Rd. 3, Newburgh, N. Y., CA est. $3,000,000. paving at Santa Maria Air Force Base. AZORES. U. S. Eng., Eastern Ocean Dist., 346 Broadway, New York, N. Y.

BUILDINGS—LB & CA

▲ **Barlut Building Corp.**, 782 E. 93 St., New York, N. Y. Owner Builds, $1,520,000. 6 story APARTMENT at 3056 Ocean Ave., BROOKLYN, N. Y. CD 6/21.

▲ **Geo. A. Fuller Co.**, 597 Madison Ave., New York 22, N. Y. and **J. N. Taylor Constr. Co.**, 31 Union Square, New York 3, N. Y. CA $2,400,000. OFFICE, 72 Wall St., 161-169 Pearl St. and 73-77 Pine St., NEW YORK, N. Y. Seaman's Bank for Savings, 30 Wall St., New York 5, N. Y. CD 5/23.

▲ **Parkview Homes**, c/o Alwin Cassens Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds, $1,750,000. 135 HOUSES on tract at Woods Rd. and Wicks Ave., NORTH BABYLON, N. Y. CD 7/26, under CA.

▲ **H. Sokolov & Sons**, 364 Conklin St., Farmingdale, N. Y. CA $2,700,000. 450 HOUSES on tract at Sunrise Hy. and Locust Ave., OAKDALE, N. Y. Sutton Park Homes, c/o contractor.

▲ **Trenton Home Builders, Inc.**, 17 Clermont Ave., Trenton, N. J. Separate Contracts. $2,000,000. RESIDENTIAL DEVELOPMENT, Hampton Hill, Ewing Twp., TRENTON, N. J.

▲ **Peck Development Corp.**, 1149 Lower Ferry Rd., Trenton, N. J., Separate Contracts, $3,000,000. RESIDENTIAL development, Lower Ferry Rd., TRENTON, N. J. Gerber & Pancans, 11 Commerce St., Newark, N. J., archts.

▲ **Cooper Village, Inc.**, c/o J. H. Utal, c/o Cooper Village, Woodbury, N. J., Separate Contracts, $3,000,000. RESIDENTIAL development, Cooper Village, WOODBURY, N. J.

▲ **Cogswell Constr. Co.**, 513 Park Ave., Baltimore 1, Md. CA 2 and 3 story, 150x325 ft., brick, concrete steel department STORE at Mondawin Shopping Center, BALTIMORE, MD. Sears Roebuck & Co., North and Harford Aves., Baltimore 18, Md. CD 7/19, under LB.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲† **Allis-Chalmers Mfg. Co.-Consolidated Western**, 739 Market St., Chattanooga, Tenn., CA $6,255,076, supersonic circuit structures, paving and drainage for Propulsion Wind Tunnel, Arnold Engineering Development Center, ENG-40-126-55-20. TULLAHOMA, TENN. U. S. Eng., Tullahoma, Tenn. Bids June 2. CD 4/18.

BUILDINGS—LB & CA

▲ **Stone & Webster Engineering Corp.**, 1400 N. Royal St., Alexandria, Va., CA est. $16,000,000, constr. and installation of No. 5 unit TURBO-GENERATOR UNIT, Potomac River Plant, ALEXANDRIA, VA. Potomac Electric Power Co., 10th and E St., N. W., Wash., D. C.

▲ **J. C. McClendon Jr.**, Box 21, Gulfport, Miss. LB $1,160,000. (9 bidders) two 3 story, 36,802 ft., brick, men's RESIDENCE HALLS, 1 story, 6,745 sq. ft. lounge bldg., Southwestern Louisiana Institute, LAFAYETTE, LA. State Bd. Educ., State Capitol, Baton Rouge, La. Bids July 28. CD 7/5.

MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,
O.—**A. Bentley & Sons Co., Inc.**, 201 Belmont Ave., Toledo, O. CA $2,069,518. Est. $2,498,000. Type T-71 and structures 1.914 mi., S.R.: 120, Sect. 2.05 (Part No. 7-Toledo Expressway System, UI-1052 (6), Oregon Twp. and city of Toledo, Lucas Co.;
O.—**Nick Cenci & Sons, Inc.**, 844 N. Cassady Ave., Columbus, O. CA $1,249,886. Type T-71 and structure 2.998 mi., U. S. R. 50, Sects. (3.58-5.81) Belpre Twp., Washington Co. CD 7/20, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Mich.—**Julius Porath & Sons**, 432 Lafayette Bldg., Detroit, Mich. and **Louis Garavaglia**, 24240 Mound Rd., Center Line, Mich. CA $2,173,407, est. $2,340,000. c. conc. paving on M-17, FI 81-67 C5-R, F1 81-67 C5-R, FI 81-67 C6-U (FI 426 2), etc., Washtenaw Co.;
Mich.—**Sargent Constr. Co.**, 2840 Bay Rd., Saginaw, Mich., CA $954,361, est. $1,040,000, c. conc. paving on M-15, F 9-15 C7-U, F 9-15 C8-R (F 239 8), Bay Co.;
Mich.—**Denton Constr. Co.**, 20415 Mack Ave., Grosse Pointe, Mich. and **Sugden & Sivier**, 13100 Cloverdale St., Oak Park, Mich. CA $737,961, est. $830,000, c. conc. paving on John C. Lodge Expressway and service roads, UI 82-128 C17 (UI 404 96), Wayne Co.;
Mich.—**Pierson Contg. Co.** and **Louis Garavaglia**, 24240 Mound Rd., Center Line, Mich. CA $711,221, est. $670,000. 2.917 mi. on M-60 etc., F 11-73 C1, F 11-73 C2 (F 427 3), Berrien Co.;
Mich.—**L. W. Edison Co.**, 924 Floral Dr. S. E., Grand Rapids, Mich. CA $790,709, est. $820,000. 9-in. c. conc. paving 11.5 mi. on US-131, F 41-90 C4-R (F116 4), Kent Co. Grand total $5,367,659. CD 7/27, under LB.

(Continued on pg. 152

In a variety of corrosive highway services WROUGHT IRON provides longer life

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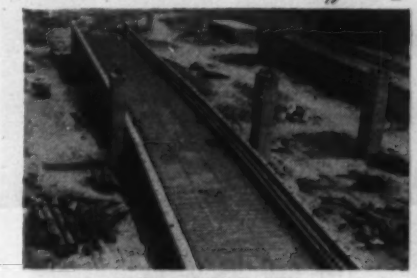
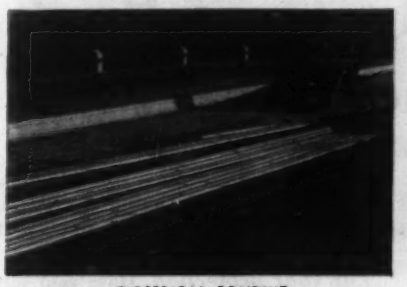


SNOW MELTING SYSTEM
Boston Aerial Highway

PROTECTIVE PLATES
State Highway Bridge over Illinois River



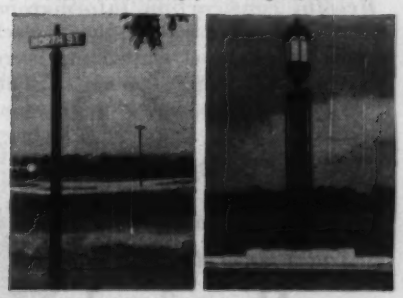
ELECTRICAL CONDUIT
Thomas A. Edison Memorial Bridge, N. J.

RADIANT HEATING IN TOLL HOUSES
Delaware River Bridge

BRIDGE DECK PLATES
University Heights Bridge, New York

HAND RAILINGS
Ninth Street Bridge, Washington, D. C.

DRAINAGE LINES
Ohio Turnpike



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(Continued from pg. 150)

BUILDINGS—LB & CA

▲ **G. W. Leckrone & Sons, Inc.**, Feedwr Rd., Dayton, O. Owner Builds, $5,500,000. 285 HOMES on 128 acres site on west side of Marshall Rd. south of Hempstead Rd., KETTERING, O. CD 12/8/54.

▲ **Leo W. Schmidt Co.**, 9920 Granger Rd., Cleveland 25, O. CA approx. $1,500,000. Est. $1,000,000. Magnificat High SCHOOL for girls and connecting residence for sisters, ROCKY RIVER, O. Sisters of the Holy Humility of Mary, c/o Catholic Diocese of Cleveland, 1027 Superior St., Cleveland, O. Geo. S. Rider Co., Terminal Tower, Cleveland 13, O., engr. Awarded July 29.

▲ **Hunzinger Constr. Co.**, 4577 N. 124 St., Milwaukee, Wis., CA est. $3,000,000. 7-story bsmnt., U-shaped OFFICE, MILWAUKEE, WIS. George Bockl, Inc., 259 E. Wells St., Milwaukee, Wis. R. E. Rasche, 601 W. Capitol Dr., Milwaukee, Wis., engr. CD 12/22/54.

▲ **A. W. King Constr. Co.**, 5301 E. Outer Dr., Detroit, Mich. Owner Builds, $3,500,000. King-Berger Development, 300 HOMES. Harper Drive section Clinton Twp., CLINTON, MICH.

▲ **Sullivan-Smith, Inc.**, 22963 Outer Drive, Dearborn, Mich. CA $1,300,000. Brookside Subdivision, 100 brick HOMES Van Born Rd., Brookside Dr. and Pardee Rd., DEARBORN, MICH. Myers-Hill Realty Co., 23280 Brookside Dr., Dearborn, Mich.

▲ **Young & Yogoda**, 19470 Grand River, Detroit, Mich. CA $1,800,000, Thurston Park Subdivision. 130 brick ranch HOUSES, REDFORD, MICH. Ross-Hill Realty Co., 19470 Grand River, Detroit, Mich.

▲ **J. F. Ferry Co.**, 19601 Grand River, Detroit, Mich. Owner Builds, $6,000,000. Eamon Park Subdivision, 500 brick HOMES, TAYLOR, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† **Texas**—BA 8/19—U. S. Eng., foot of Prytania St., New Orleans, La., constr. and completion of Ferrells Bridge Dam and appurtenances on Cypress Creek near Jefferson, Marion Co. Est. $5,000,000. CD 5/27/49.

BUILDINGS—BA

▲ **Tex., Birdville**—SCHOOLS—BA 8/30—Birdville Independent School Dist., Birdville, No. 1, Junior High School, $500,000; No. 2, Junior High School, $500,000. Wilson, Patterson & Assocs., 601 Bailey St., Box 9035 Fort Worth, archts. CD 2/18/55.

▲ **Tex., Houston**—CLUB HOUSE, etc.—BA 8/30—Houston Country Club, 7000 Harrisburg Blvd., club house, $850,000; swimming pool, bathhouse, $90,000. Walter P. Moore, 2 Pinedale St., E. G. Pearson, 1010 Winbern St., H. E. Bovay, Jr., 245 M. Esperson Bldg., engrs.; golf course, athletic courts, $100,000. Wilson, Morris & Crain, 3330 Graustark St., archts. for entire proj. Thomas Church, 402 Jackson St., San Francisco, Calif., land planning. CD 2/25/55.

▲ **Tex. Echo**—PLANT—Bids Asked—Texas Portland Cement Co., Echo, cement mfg. plant, $2,500,000. CD 6/10.

BUILDINGS—SLC

▲ **Tex., Fort Worth**—FACTORY—American Can Co., 100 Park Ave., New York, N. Y., soon lets contract, 35,000 sq. ft. masonry, concrete and steel factory on Hy. 80 east of here. $2,500,000.

HEAVY CONSTRUCTION—LB & CA

▲ **KANSAS**—Kansas Turnpike Auth., P.O. Box 681, Topeka,
KTA—**Broce Constr. Co., Inc.**, Dodge City, Kan. CA $2,629,211. b. conc. 13.8 mi., Lyon Co.;
KTA—**J. B. Michael Co., Inc.**, P. O. Box 5895, Memphis, Tenn. CA $1,750,516. b. conc. 9.55 mi. Lyon, Osage and Wabaunsee Counties; CA $1,477,218. b. conc. 7.11 mi., Lyon Co.;
KTA—**Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Iowa. CA $1,551,016. c. conc. 8.07 mi., Douglas Co. Bids July 29, awarded Aug. 1. Grand total $7,407,961. CD 8/2, under LB.

▲ **KANSAS**—Kansas Turnpike Auth., P. O. Box 681, Topeka,
San Ore Constr. Co., McPherson, Kan. CA $1,754,133. b. conc. 9.32 mi., Sumner Co.; CA $1,572,801. b. conc. 8 mi., Sumner Co. Bids July 15, awarded Aug. 1. CD 7/20, under LB.

▲ **KANSAS**—Kansas Turnpike Auth., P. O. Box 681, Topeka,
KTA—**Payne & Dolan, Inc., and Badger Materials, Inc.**, First National Bank Bldg., Chicago, Ill. CA $1,810,361 b. conc. 9.99 mi., Butler Co.;
KTA—**T. F. Marbut**, Columbia Bldg., Emporia, Kan. CA $1,677,771. b. conc. 8.22 mi., Chase and Lyon Counties;
KTA—**Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Iowa. CA $1,496,900. c. conc. 7.33 mi., Shawnee and Douglas Counties;
KTA—**R. G. Aldridge Contr.**, 1610 Nebraska Ave., Kansas City, Kan. CA $1,187,004. grading, drainage 1.08 mi. Wyandotte Co. Bids July 22, awarded Aug. 1. Grand total $6,855,036. CD 7/28, under LB.

BUILDINGS—LB & CA

▲ **Jones Store Co.**, 12 and Main St., Kansas City, Mo. Own Forces, Est. $4,000,000-$5,000,000. rebuilding, enlarging 400,000 sq. ft. STORE, altering facade on Walnut St. frontage, KANSAS CITY, MO. Wm. J. Fullerton, Jr., 15 W. 10 St., Kansas City, Mo. and Voskamp & Slezak, 18 E. 11 St., Kansas City, Mo., archts. CD 9/29/54.

(Continued on next page)

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., Los Angeles**—BA 8/19—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. 241, Cabrillo Ave. Drain and Unit 1 of (Proj. 76) Normandie Ave. to Western Ave. storm drain, Torrance, $1,000,000. H. E. Hedger, c/o owner, engr. CD 11/7/52.

▲ **Calif., Los Angeles**—BA 8/26—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. No. 6, Compton Creek No. 2, Unit No. 1, portion of lines A and E, Lynwood. $1,000,000. H. E. Hedger, c/o owner, engr. CD 11/7/52.

BUILDINGS—BA

▲ **Calif., Los Angeles**—JUVENILE HALL—BA 8/31—Los Angeles Co., Hall of Records, juvenile hall unit at Rancho Los Amigos, est $2,400,000. CD 6/15/54.

▲ **Calif., Santa Monica**—AUDITORIUM—BA 9/27—City, City Hall, civic auditorium, $2,850,000. Barienbrock & Murray, 600 Wilshire Blvd., archts. CD 11/5/54.

HEAVY CONSTRUCTION—LB & CA

† **J. H. Sellen Constr. Co.**, 228 9th Ave. N., Seattle, Wash., CA $710,610. guided missile launching and control areas, Vashon, ENG-45-108-55-241, WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 30. CD 7/8, under LB.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, **Granite Constr. Co.**, P.O. Box 900, Watsonville, Calif. CA $962,632, grading, surf. 1.6 mi. Sign Rte. 1; three rein.-con. bridges, one pedestrian overcrossing, Santa Cruz Co. Bids July 20, awarded Aug. 1. CD 7/26, under LB.

▲ **Dpt. Navy**, 11th Naval Dist., San Diego, Calif. rejected bids June 29, addnl. facilities, Increment 1, Spec. 45843, NOY 86732, SAN NICHOLAS ISLAND, CALIF. LB $1,402,057. CD 7/6, under LB.

BUILDINGS—LB & CA

▲ **Peter Kiewit Sons Co.**, 345 Kieways Ave., Arcadia, Calif., LB $1,507,528, HIGH SCHOOL, AZUSA, CALIF. Citrus Union High School Dist., 18824 E. Foothill Blvd., Azusa, Calif. Bids Aug. 1. CD 7/13.

▲ **Roach & Peck**, 5017 Telegraph Rd., Los Angeles, Calif., CA $1,600,000. two 300x420 ft. steel INDUSTRIAL bldgs., CULVER CITY, CALIF. Douglas Aircraft Co., 3000 Ocean Park Blvd., Santa Monica, Calif. Awarded July 28.

▲ **Gust K. Newberg Constr. Co.**, 2040 N. Ashland Ave., Chicago, Ill., CA $19,647,000, superior COURTS BLDG., First and Temple Sts., LOS ANGELES, CALIF. Los Angeles Co., Hall of Records, Los Angeles, Calif. Bids July 19. CD 7/26 under LB.

▲ **Flagler Land Co.**, 1224 S. Beverly Dr., Los Angeles, Calif., CA $1,922,800, 209 DWELLINGS, Havemyer Lane, etc., in tract 21045, REDONDO BEACH, CALIF. Blossom Land Co., 1224 S. Beverly Dr., Los Angeles, Calif.

CANADA

HEAVY CONSTRUCTION—BA

▲ **ONTARIO**—BA 8/17—Dpt. of Hys., Toronto, **Belleville**—bridge over Morira River on proposed Hy. 401 1¼ mi. north of here $1,500,000. CD 7/26.

HEAVY CONSTRUCTION—LB & CA

▲ **Dominion Bridge Co. Ltd.**, Box 280, Montreal, Que., CA $1,698,800 (7 bidders) supply 48 sets of headgates, hoists and embedded parts for Canadian powerhouse of the St. Lawrence Proj. near Cornwall, ONTARIO. Ontario Hydro-Electric Power Comm. of Ontario, 620 University Ave., Toronto 2, Ont. Bids July 14. CD 6/17.

BUILDINGS—LB & CA

▲ **A. Charron & Son**, Gatineau, Que., CA est. $1,000,000. 100 units HOUSING program, 30-acre site near Hull-Masson Rd., GATINEAU, QUE. Phillippe & Theoret, 331 Notre Dame St., Gatineau, Que. Awarded July 15. CD 7/14, under CA.

LATIN AMERICA

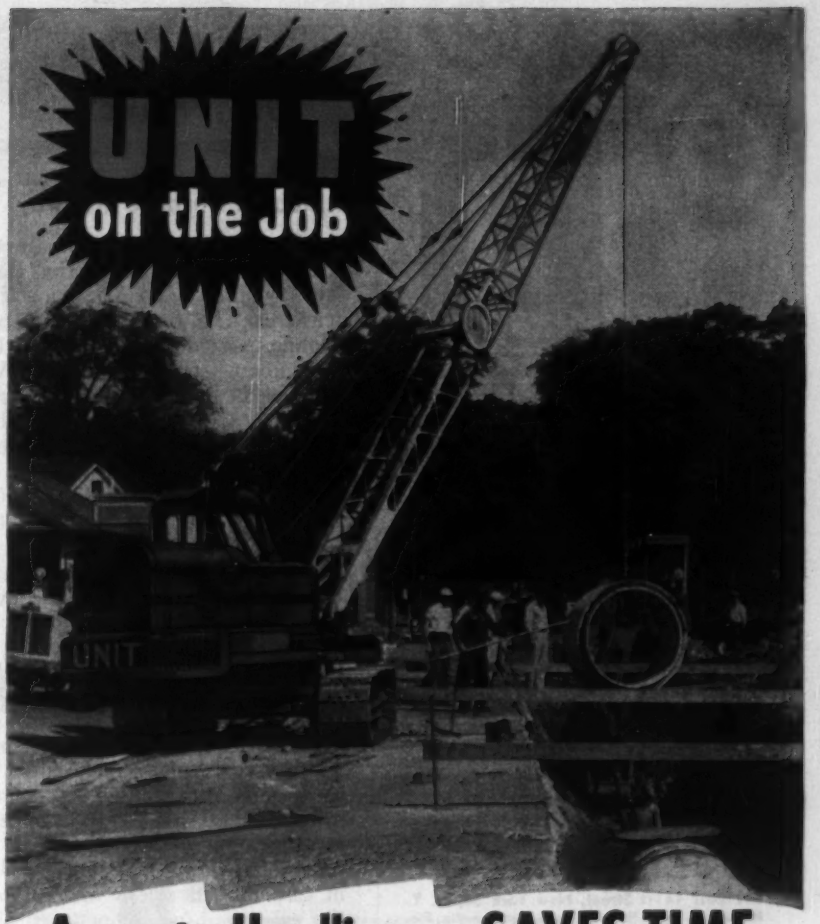
HEAVY CONSTRUCTION—BA

▲ **Guatemala**—BA 9/1—Guatemalan Govt., Hy. Auth., Guatemala City, Proj. 16, approx. 30 kilometers, grading, drainage, crushed gravel or stone base course, Selegua Canyon Area. Inter-American Hy. Proj. CD 2/13/53.

▲ **Guatemala**—BA 9/10—Guatemalan Govt., Hy. Auth., Guatemala City, Proj. 18, approx. 60 kilometers, grading, drainage, crushed gravel or stone base course, Patzicia to Santa Apolonia. Inter-American Hy. Proj. CD 2/13/53.

Colombia—BA 9/14—Ministry P. Wks., Bogata, combination railroad and highway bridge (total length 1,290 ft. span) over Magdalena River at Puerto Berrio for Atlantic R. R. Plans deposit $25. (Correction-length of bridge). Madigan-Hyland South American Corp., 28-04 41 Ave., Long Island City, N. Y. engrs. CD 7/21.

▲ **Guatemala**—BA 9/16—Guatemalan Govt., Hy. Auth., Guatemala City, Proj. 17, approx. 72 kilometers, grading, drainage, crushed gravel or stone base course, vicinity of Malacatancito, Inter-American Hy. Proj. CD 2/13/53.



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UNIT PRICES

Alabama Airbase Runway

The asphalt paving alternate took the $1,665-million award for Brookley Air Force Base, Ala., runway extension. The Corps of Engineers Mobile, Ala., district let the contract to Harbert Construction Co. Work is under the direction of Army District Engineer Col. Harold E. Bisbort. Brookley AFB is located in Mobile County.

Specifications call for a 2,600-ft runway extension projecting 800 ft southeast into Mobile Bay, an embankment for a fuel storage area, a taxiway and access road. The extension, taxiway, and road involve clearing an 80-acre area, relocating 12 houses, and pumping about 2 million cu yd of fill material from the bay with hydraulic dredges. The fuel storage area requires an embankment of 185,000 cu yd of hydraulic fill, a protective dike containing 9,000 cu yd of mechanical fill to retain the pumped-in material; and 350-ft of 12-in. cast-iron sewer line. The sewer line is for use in case the fill proves too heavy for the existing disposal line over which it will be placed.

Minimum hourly wage rates include: for dredging, leverman $1.65, first engineer's assistant $1.65, second engineer's assistant $1.45, laborer $1.00, derrick operator $1.35; laborers, pipe laying, air operating tools, mortar mixer, creosote material, $1.67; plumbers and steamfitters $3.05; power equipment operators, shovel $2.915, front end loader $2.915, roller, paving machine, concrete plant and asphalt spreader $2.775; truck drivers 1½- to 5-ton $1.97.

Completion dates are Sept. 1, 1955 for the fuel storage area fill with liquidated damages set at $100 per calendar day; and Oct. 15, 1956 for the runway, taxiway, and road, with liquidated damages $200 per day. The contractor shall pay $500 for each calendar day both runways are closed in excess of the time approved in the work schedule.

Bidders include:

1C	Harbert Construction Co., Birmingham, Ala.	
	base bid, flex pvmt & additive alt. 2	$1,665,678[a]
	bid with concrete alt A & additive alt. 2	1,839,929
2	Foster & Creighton Co., Nashville, Tenn.	
	base bid, flex pvmt & additive alt. 2	1,760,922
2	Southern Roadbuilders Inc., Augusta, Ga.	
	bid with concrete alt. A & additive alt. 2	1,917,564
4	Southern Roadbuilders Inc., Augusta, Ga.	
	base bid, flex pvmt & additive alt. 2	1,928,915
4	Wright Contracting Co., Columbus, Ga.	
	bid with concrete alt. A & additive alt. 2	2,033,188
EE	Corps of Engineers, Mobile, Ala.	
	base bid, flex pvmt & additive alt. 2	1,586,427
	bid with concrete alt. A & additive alt. 2	1,716,013

Bids: 6-21-55 Items	Unit	Quantity	Unit Prices 1C	Unit Prices 2b
Fuel storage area fill:			$112,120	$120,097
Clear & grub	ls	.....	5,500	6,000
Remove fence	lf	540	0.40	0.42
Mechanical fill	cy	9,000	0.80	0.46
Hydraulic fill	ls	.....	90,000	100,000
CIP 12" for emergency by-pass sewer line, new pipe	ls	.....	3,150	2,800
Valve pit	ls	.....	2,100	3,900
Remove or fill MH's	ls	.....	150	210
Sodding for dike	sy	3,000	1.25	0.95
Seed area stripd of sod	ac	0.6	90.00	100.00
Sewer 12", additive alternate:				
Salvage existg CIP, alt 1	ls	.....	5,650	5,000
Const new perm line & MH				
alt 2, all new CIP	ls	.....	15,800	11,500
alt 3, salvgd & new P	ls	.....	14,330	7,500
Runway, taxiway, road:			687,733[c]	706,403[c]
Remove fence	lf	6,820	0.42	0.42
Clear, grub, remi work	ls	.....	30,000	33,500
Hydraulic fill	cy	1,500,000	0.34	0.345
Settlement gage	ea	6	125.00	400.00
Storm drain pipe, 12"	lf	484	3.25	2.00
15"	lf	238	3.60	2.60
Culvert pipe, 15"	lf	32	4.10	3.20
Storm drain P 21", new, salvgd	lf	684	6.00	4.50
	lf	210	3.50	3.70
Culvert pipe, 21"	lf	108	6.50	5.20
Storm drain pipe, 24"	lf	400	7.00	6.50
Culvert pipe, 24"	lf	102	7.40	7.00
Storm drain P 30", new, salvgd	lf	90	11.00	9.50
	lf	210	6.00	6.30
36"	lf	220	14.50	12.50
Culvert pipe, 36"	lf	128	15.00	13.50
Storm drain pipe 42"	lf	641	18.00	16.00
Culv P 42", rubr gasket	lf	184	19.50	21.00
Storm drain pipe 48"	lf	191	23.50	23.00
Culvert pipe 48"	lf	32	24.00	25.00
Reinf conc in dr struct	cy	165	100.00	105.00
Grates & frames	lb	13,260	0.20	0.25
Outfall structures	ls	.....	1,250	2,000
Conc-encs duct 2-way 4"	lf	295	3.80	4.00
4-way4"	lf	1,215	4.50	4.70
Direct-burial duct 3"	lf	350	2.00	2.10
Handhole, type A-1	ea	6	250.00	260.00
Threshold light bases	ea	12	120.00	125.00
Lowering existing cable	lf	800	1.50	1.60
Movable painted crosses	ls	.....	3,500	2,500
Slvgd fence type FE-6, I	lf	5,210	0.77	0.76
Fence, new type FE-6	lf	6,135	2.10	2.20
Salvaged gates, I	ls	.....	20.00	27.00
Gate 12' new	ls	.....	150.00	175.00
Seeding	ac	168	90.00	100.00
Mulching	ac	38	170.00	90.00
Sodding, inlts, headwall	sy	435	1.25	1.30
Relocate houses, 12	ls	.....	25,000	35,000
Conc masy units 8x16" in hs fndn walls & piers	ea	6,000	0.75	0.60
Replace defective sills & joists	Mfbm	2	350.00	300.00
Paving, base bid items:		850,025	922,922	
Excavation, unclass	cy	588,700	0.44	0.45
Sand-clay sub-bs crse 6"	sy	88,300	0.38	0.55
Shell base course 6"	sy	94,980	1.25	1.57
Bituminous prime coat	gal	31,375	0.14	0.15
tack coat	gal	28,250	0.14	0.15
Asph conc bnd crse 2½"	t	14,158	8.00	8.30
surf crse 2"	t	311	9.00	9.30
1½"	t	9,509	8.00	8.30
Bitumen for asph conc	gal	223,520	0.10	0.10
Concrete pvmt 15"[d]	sy	29,717	7.55	8.13
Paving, alternate A:		1,024,276	1,082,598	
Excavation, unclass	cy	565,475	0.48	0.44
Sand-clay sub-bs crse 6"	sy	2,800	0.50	0.54
Shell base course 6"	sy	29,575	1.40	1.52
Bituminous prime coat	gal	8,800	0.14	0.15
tack coat	gal	13,000	0.14	0.15
Asph conc bnd crse 2½"	t	5,254	8.00	8.90
surf crse 2"	t	311	9.00	9.15
1½"	t	4,787	8.00	8.90
Bitumen for asph conc	gal	40,130	0.10	0.10
Concrete pvmt 15"[d]	sy	71,747	6.50	7.15
13"	sy	26,867	5.75	6.55

[a] Base bid total without sewer additive alt: 1 $1,649,878; 2 $1,748,422; 4 $1,917,427. Total bid with pavement alternate A, & without sewer additive 1 $1,824,129 2 $1,906,076; EE $1,697,618

[b] Second low base bid, flexible pavement; [c] Without paving

[d] Concrete flexural strength: 650 psi at 28 days, ASTM standard C 78-49; mix will be by ASTM C 231-54. Cement content: portland, portland blast-furnace slag, or a blend of portland and slag or natural in a proportion not exceeding 25% slag or natural to 75% portland on the basis of solid volume.

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First-Half Results: A Pretty Picture

	First Half Sales (in thousands)		First Half Profits (in thousands)		Profit Margin %	
	1955	1954	1955	1954	1955	1954
Air Conditioning & Heating						
Amer. Radiator	$156,643	$138,157	$8,497	$7,221	5.4	5.2
Minn.-Honeywell	114,859	112,863	7,241	7,020	6.3	6.2
Trane	25,388	24,461	1,361	1,710	5.4	7.0
York	49,146	56,999	1,981	2,036	4.0	3.6
Cement						
Alpha Portland	14,540	12,367	2,387	1,596	16.4	12.9
General Portland	18,425	15,900	3,820	3,117	20.7	19.6
Lehigh Portland	31,940	24,702	4,632	2,661	14.5	10.8
Lone Star	43,578	39,605	6,601	5,735	15.1	14.5
Penn-Dixie	18,342	13,727	2,818	1,998	15.4	14.6
Equipment						
Allis-Chalmers	267,041	258,868	12,563	13,491	4.7	5.2
Blaw-Knox	48,590	55,603	969	2,159	2.0	3.9
Bucyrus-Erie	32,343	37,671	2,694	2,985	8.3	7.9
Caterpillar	251,291	198,244	15,447	12,628	6.1	6.4
Crane	151,515	138,080	3,635	2,608	2.4	1.9
Gardner-Denver	21,441	15,270	2,088	1,297	9.7	8.5
Walworth	21,577	20,161	934	27	4.3	0.1
Wallboard & Roofing						
Certain-Teed	64,750	30,816	3,838	2,014	5.9	6.5
Johns-Manville	131,720	116,729	9,262	8,028	7.0	6.9
Nat'l Gypsum	71,744	60,016	7,791	5,914	10.9	9.9
Miscellaneous						
National Lead	256,791	209,222	23,503	17,570	9.2	8.4
Otis Elevator	48,057	52,894	4,729	4,321	9.8	8.2
Pitts. Plate Glass	288,536	202,232	32,563	16,908	11.3	8.4
Weyerhaeuser	158,086	132,453	26,255	18,834	16.6	14.2

Suppliers Are Doing Well

First half reports of most companies who supply the construction industry are out now. By and large, they present a very bullish picture (table above). Sales and profits of nearly every company are higher than in the first half of 1954. In some cases, the increases are substantial. And—perhaps equally significant—profit margins of the great majority of supplier firms are better than they were in the first half of 1954.

As during the first quarter, there are some exceptions in the air-conditioning and heating field. In this group, the two smaller companies in the table had lower profits than last year. And of these, one manufacturer suffered a decline in sales and the other had a fairly substantial decline in profit margin.

• **Cement companies**—Among cement companies, shown in the table, things were very good indeed. All the companies increased their sales and profits, and boosted profits faster than sales. The profit margins in this group are the widest among construction suppliers, which should give strong financial backing for the large-scale expansion program now being carried out by the cement industry.

• **Equipment**—In the equipment field, three of the seven companies listed in the table had lower profit margins than during the same 1954 period. But all three improved on their profit margins of the first quarter. Though Blaw-Knox results for the first half were below the same period last year, the company's showing was much better than in the first quarter. That suggests its program of plant relocation and reorganization is getting results.

Bucyrus-Erie also has improved on its first-quarter results, and showed a higher profit margin than in the first half of last year. This indicates that the pickup in the construction-equipment market is starting to reach the heavy equipment on which B-E concentrates.

• **Wallboard & roofing**—In the wallboard & roofing field, Certain-Teed had a spectacular gain in sales which was almost matched percentage-wise by profits. All companies did better on profit margins than in the first quarter.

Tighter Money

Banks and FRB make it a bit harder to borrow

If anyone needed any further proof that money for construction is going to be harder to find in coming months, he got two very convincing pieces of evidence last week:

• Commercial banks in the leading U. S. money centers boosted from 3% up to 3¼% the rate they charge blue-ribbon customers for short-term loans. That means rates for business borrowers with less persuasive credit ratings also will go up.

• The Federal Reserve Board approved boosts in the rediscount rate for several of its district banks. The Federal Reserve Banks of Chicago, Boston, and Atlanta boosted from 1¾% to 2 % the rate they charge their member banks for loans. Cleveland went to 2¼%. Other Federal Reserve Banks soon fell into line.

Both these boosts affect the short-term side of the money market. But the long-term part of the market also has been tightening, due in part to the actions that have been taken by the Treasury.

• **No surprise**—Last week's moves—particularly the hike in the commercial banks' prime rate—had been foreshadowed for months. Commercial banks have been cutting down their lists of customers entitled to the lowest interest charge, and edging up the rates they charge other customers. And it has long been an open secret that the Administration intended to take general measures to tighten up

(Continued on page 159)

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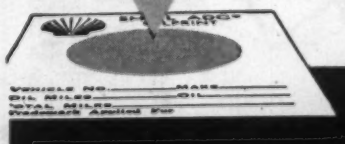

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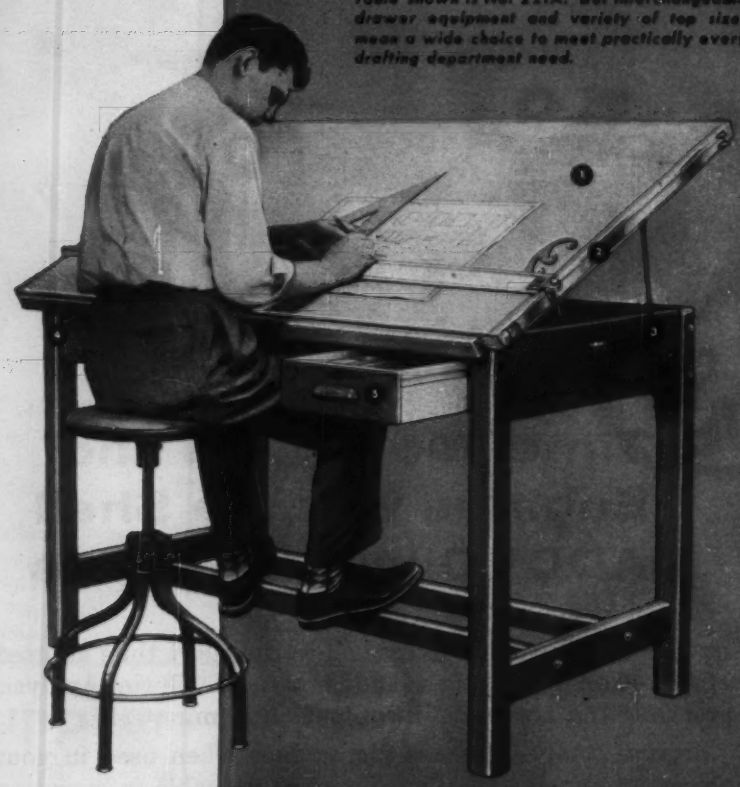
Table shown is No. 221A. But interchangeable drawer equipment and variety of top sizes mean a wide choice to meet practically every drafting department need.



Economy is only one factor in the popularity of Hamilton Four-Post wood drafting tables. Bases are carefully selected and seasoned hardwood—strong and steady for long, satisfactory service. Heavy legs are 2½ inches square for solid rigidity, their corners rounded for appearance and no-snag protection. Easy-running drawers have non-warping welded fiber bottoms. Key-stock basswood tops are smooth and square, will not warp nor develop cracks, holes or crooked edges. Standard 37-inch height and convenient adjustability make for fast, comfortable work and maximum draftsman-productivity.

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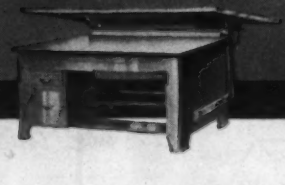


Steel UnitSystem filing units

Hamilton DRAFTING EQUIPMENT

HAMILTON MANUFACTURING COMPANY
Two Rivers, Wisconsin

slightly in bank credit to business. It had already made several specific moves.

• **Mortgage crackdown**—Only a few days ago, for instance, the Veterans Administration started requiring a 2% down payment, instead of none, while the Federal Housing Administration boosted the minimum down payment from 5% to 7%. Both agencies cut the maximum terms of mortgages they will guarantee in future from 30 years back to 25. This is not expected to slow down home starts by more than 100,000 at the most this year. Several hundred thousand applications for insurance, already on file, won't be affected.

Actually, this move on the part of the Administration to discourage marginal home buyers may provide some more long-term money for other types of construction. Some investors who would have bought mortgages may now buy new issues of long-term corporate and munincipal bonds instead.

Plywood: Popular, but Hard to Get

Plywood is gaining on lumber in the construction market. You can see from the top chart how total production of Douglas fir plywood has been overtaking lumber shipments.

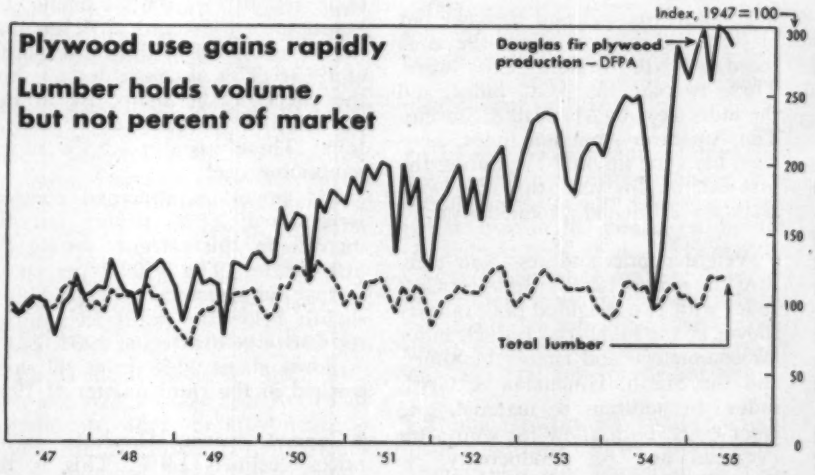
For instance, ENR's index of plywood production in May was about three times what it was in the 1947 base year. But lumber shipments in the same month (the latest figure available) were up only 22%, according to the National Lumber Manufacturers Association. For the first five months of this year total lumber shipments were only 6% ahead of 1954, while production of fir plywood was up 21%. Lumber, of course, still gets the bulk of the business.

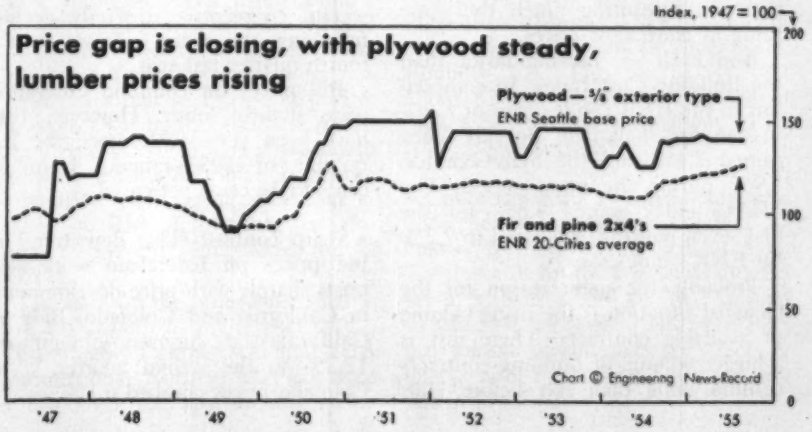
It isn't possible to tell how much of the total output of plywood and lumber goes into construction. But the percentage is at least 65%.

• **Prices**—Though plywood use has been gaining, its price has been more stable lately than lumber (lower chart). As of August, the Seattle mill price of Douglas fir plywood, ⅜ in. exterior type, reported by ENR is $190 per 1,000 sq ft, the same as in January. But the ENR 20-cities average of fir and pine 2x4s has increased 5.2% this year.

According to one industry source, some of the big plywood distributors have been at work persuading the mills not to raise prices. That's because the industry is making a satisfactory profit at the current high level of sales. The distributors' argument is reported to be: Why risk plywood's increasing popularity by boosting prices?

The lower chart also shows how the price differential between plywood and lumber is narrowing. As this gap narrows, plywood's competitive position improves.





• **Production**—That is one reason why fir plywood production for the first 29 weeks of this year is up 31% over last year. The other reason, of course, is last summer's long strike at the Pacific Northwest mills. New orders for the first 20 weeks are up 24%.

• **Backlog**—The backlog of unfilled orders remains very high. This partly because of the shortage of "peeler" logs, partly because of the boxcar shortage. The total backlog as of July 23 was 534,000,000 sq ft, not much below the record of 585,000,000 sq ft reached last February. The normal backlog is around 300,000,000 sq ft.

• **Slow deliveries**—That means it will be a long time before deliveries of plywood will get back to normal.

Dry weather makes it difficult for the mills to build up reserves of peeler logs, the high-grade timber needed for sanded plywood. Forests are tinder-dry now, and logging crews are staying out of the woods.

Finally railroad officials are predicting that the boxcar shortage will continue to be serious until late fall.

Work Put-in-Place in July Totals Almost $4 Billion

Dollar value of construction put-in-place during July was nearly $4 billion, according to estimates released last week by the Labor and Commerce Departments. They figure that is a record annual rate of $42 billion, when adjusted for seasonal factors.

Total dollar value of work put-in-place for the first seven months was $23.1 billion, the government agencies estimated. They attributed a 4% increase over June to expansion in home-building, store and office construction, and highway work.

(*B&F continued on page 160*)

Building Cost and Price Index Roundup

Indexes, 1913 = 100

Weighted Cost Indexes		Mar.	Apr.	May	June	July	Aug.4
ENR Construction Cost	1913 = 100	646	647	653	656	660	**673**
ENR Building Cost	1913 = 100	460	461	463	465	468	**478**
Assoc. General Contractors	1913 = 100	432	434	435	439	**443**	...
American Appraisal*	1913 = 100	600	601	602	**604**	...	...
Marshall & Stevens	1926 = 100	470	...	...	**474**	...	...
Weighted Price Indexes**							
Boeckh, comm'l & mfg	1926-29 = 100	456	459	461	**464**	...	...
Smith, Hinchman & Grylls	1926 = 100	509	514	516	520	**529**	...
Contractor Price Indexes							
Aberthaw***	1914 = 100	396	...	...	**397**	...	...
Austin	1926 = 100	357	...	...	**361**	...	...
Fruin Colnon	1926 = 100	475	477	483	483	**486**	...
Fuller	1913 = 100	...	**456**	...	...	...	...
Turner	1939 = 100	...	493	...	...	**500**	...

* Adjusted for estimated productivity.
** Includes overhead, profit, adjusted for estimated productivity.
*** Indexes shown are based on 1914=100.

Is the Contractor Squeeze Easing?

Materials and wage costs are rising more slowly now than the prices building contractors charge for their work

The squeeze on building contractors seems to be easing. That is the very important inference you can draw from a study of the latest available cost and price index figures (table, above). The prices building contractors are charging for their work are rising faster at the present time than their costs.

For instance, while ENR's Building Cost Index rose 1.6% during the first half of this year, and 2.2% in seven months, the Fruin Colnon index rose 2.1% and 2.7%, respectively. The Austin index rose 1.6% for the first half, and the Turner index climbed 2.6% for the first seven months.

This is a reversal of the trend earlier this year, when the majority of contractor price indexes climbed slower than the Building Cost Index (May 26, p. 145). The only dissenting opinion is the Aberthaw price index, which rose scarcely at all in the first half.

These contractor indexes measure trends in actual prices charged by contractors for finished buildings. They differ from ENR's cost indexes, which measure what contractors have to pay for labor and materials.

• **Compare others**—If you compare other weighted cost indexes that measure changes in materials prices and wage rates, you will find that two out of three are rising at about the same speed as ENR's Building Cost Index. These two are the AGC index, and the index kept by Marshall & Stevens. The American Appraisal index, however, has gone up only 1% during the first half of this year (this index corrects for estimated productivity).

• **Weighted price indexes**—Now compare the rise in ENR's Building Cost Index with two weighted price indexes shown in the table—the Boeckh index for commercial and factory buildings, and the Smith, Hinchman & Grylls index. In addition to materials and labor costs, both allow for contractor overhead and for productivity. So they are measuring much the same thing as contractor prices.

And both are moving faster than the Building Cost Index. In comparison to the ENR's index gain of 1.6% in the first half, the Boeckh index gained 2.1% and the SH&G index, 2.9% during the same period. The SH&G index gained 4.8% for the first seven months, compared to 2.2% for ENR's index.

Probably the main reason for the changed situation is the rising volume of available contracts. There just is a bigger volume of building contracts coming along than ever before. But, in a way, it has been very fortunate for the industry that it has had to go through a "shake-out" period before this latest boom came along.

BPR Figures Show Prices Are Dropping on Federal-Aid Work

Contractor bid prices on federal-aid highway jobs declined during the second quarter of this year, in contrast to the trend in the building field.

The Bureau of Public Roads Composite Mile Bid Price Index was down 1.6% below the first quarter. This is the second consecutive quarterly decline, and brings prices down almost to the very low point of the third quarter of last year.

However, there have been no important swings in the BPR Index during the last 18 months. It has moved within a range of 149.2 and 152.4, based on the average price during 1925-1929 as 100. The latest index figure is 149.4.

• **All major items down**—Prices of all major bid items included in the index declined during the second quarter. The sharpest drop was a 3.2% decline in structural steel bid prices. This brought the average bid price for structural steel to 15.2 cents a pound, the lowest since 1950, and 22% less than the high reached in the third quarter of 1953. (This of course doesn't show the effect of the sharp rise in mill prices which went into effect early in July.) There was also a 0.9% dip in reinforcing steel.

Bid prices on structural concrete were down 2.1%, wiping out the increase in this category during the first quarter. The $50.09 per cu yd average for structural concrete bids is slightly below the steady level during the last three quarters of 1954. But it is down about 11% from the high reached in the third quarter of 1952.

• **Concrete paving**—Concrete paving prices declined 1.9%. This is the second consecutive quarterly decline following the sharp increase in the fourth quarter last year.

Bid prices for common excavation were slightly lower. However, they have been very stable since the last quarter of 1953—ranging from 35 cents to 36 cents per cu yd.

• **Sharp contrast**—This downtrend in bid prices on federal-aid work contrasts sharply with price developments in California and Colorado. Bids on California state highway jobs jumped 12.2% in the second quarter, while Colorado prices climbed 6.1%.

NAREB Survey Shows Market For Buildings Is Still Strong

The market for existing buildings has a direct affect on volume of new construction. That's why the periodic surveys of the National Association of Real Estate Boards make interesting reading for construction men. The latest survey, made this spring, shows no slackening in the demand for new homes and new commercial and industrial buildings.

Here are some of the highlights of the survey:

- The decline in prices of used homes is leveling off, though they generally are lower than a year ago. Transfers of such homes are higher than a year ago only in the under-$10,000 bracket.
- Prices of new homes tend to be higher than a year ago. Transfers of new homes are up in all price classes from a year ago.
- On retail business properties, prices are up, especially in outlying areas. Transfers are down slightly in central-city locations, up sharply in outlying areas.
- About as many communities report higher prices for downtown office buildings as those reporting lower prices. Prices of outlying office buildings have risen in more places than where they have declined.

Prices of existing one-story buildings are higher in more communities than in those reporting lower prices. In most places, prices of multi-story structures are lower. Prices are everywhere higher than a year ago on improved industrial sites, and in most places on unimproved sites.

FHA Moves to Take Over Subsidiary of Tishman Realty

The Federal Housing Administration is moving to take over Rego Park Apartments, Inc., an apartment development in Elmhurst, Long Island, whose mortgage FHA insured under Sec. 608. All common stock is held by Tishman Realty & Construction Co., New York City.

FHA says that in 1951, a year after the project was built, Rego Park Apartments paid a $1.7-million dividend to Tishman Realty in violation of the corporation charter. It also charges that Rego Park Apartments has also failed to file cost data asked for by FHA

Tishman, on the other hand, denies that it is at fault in any respect.

Presumably Tishman will fight FHA Commissioner Norman Mason's steps to take over the apartment corporation. Mason already has asked for a meeting of Rego's preferred stockholders—which consist of FHA—to take over the company and look into its affairs. If successful, this would be FHA's ninth take-over of Sec. 608 projects.

Business Briefs . . .

- **Demand for steel** in construction has led to price boosts by small producers. Phoenix Iron & Steel Co., Phoenixville, Pa., has boosted its price on standard and wide-flange structural by $10 a ton above the competition. And Central Iron & Steel Co., Harrisburg, has raised the price of carbon plates $12 a ton above prevailing prices. Both companies sell extensively to the construction industry.

- **AEC headquarters**—AEC finally has picked the site of its new $10-million headquarters. It will be near the village of Germantown, Md., just off Route 240 about 23 mi northwest of Washington. Voorhees, Walker, Smith & Smith are architect-engineers. Design probably will be three-story reinforced concrete. The building and location are planned to provide reasonable protection against blast effects of a thermonuclear attack on Washington, and to provide access to Congress and the executive branch. Bids will be called later this year with work scheduled to start in 1956.

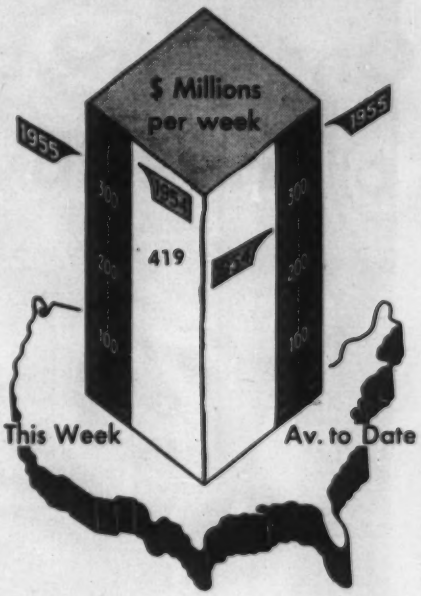
- **Chicago booms**—More money has been spent for industrial building projects in the six-county Chicago metropolitan area in the first seven months of this year than in all 1954, says the Chicago Assn. of Commerce & Industry. Capital spending through July for new plant, additions, and land acquisition totals $238 million, compared with $232 million for all last year.

- **Atomic reactor** for industrial and medical research will be built by AMF Atomics, Inc., for a group of eight industrial companies. AMF Atomics is a subsidiary of American Machine & Foundry Co. The reactor, to cost about $2 million, will be located in New Jersey or New York about 50 mi from New York City.

- **Concrete paving awards** in July were 38% below June's high volume, according to the Portland Cement Assn. Total awards for the first seven months set a postwar record of 56.2 million sq yd—20% more than last year. Record volume of contracts for streets & alleys, and for airports sparked the rise in 1955.

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

(millions of dollars)	This Week	Cumulative 32 wks 1955	1954	% chge
By Ownership				
Federal	$17.6	$1,137.9	$779.4	+46
State and municipal	128.6	3,311.1	3,012.4	+10
Total public	146.2	4,449.0	3,791.8	+17
Total private	188.2	7,311.4	5,074.7	+44
U. S. Total	$334.4	$11,760.4	$8,866.5	+33
By Type of Work				
Waterworks	$2.6	$159.2	$136.6	+17
Sewerage	6.9	238.0	234.4	+2
Bridges	9.7	297.1	301.6	−1
Highways	59.9	1,340.5	1,144.5	+17
Earthwork, waterways	10.7	332.5	169.7	+96
Buildings:				
Public, excl. hsg.	46.1	1,103.9	1,101.6	+0.2
Public housg.	3.3	168.7	155.4	+9
Private housg.	75.5	4,003.7	2,664.8	+50
Commercial	21.7	1,078.9	788.5	+37
Industrial	82.0	1,727.5	1,216.5	+42
Unclassified	16.9	1,310.4	952.9	+38
U. S. Total	$334.4	$11,760.4	$8,866.5	+33

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

(millions of dollars)	Week of Aug. 4	Cumulative 31 Wks 1955	1954	% Chge '54-'55
Corporate securities	$12.3	$2,086.0		+10
State and municipal:				
All except housing	112.0	2,636.5		−23
Housing	...	63.2		−10
Federal loans	1.4	81.2		+7
Federal aid	...	742.5		+18
Total nonfederal	125.7	5,609.4		−8
Federal appropriations:				
In U. S.	...	516.1		−54
Outside U. S.	...	46.9		+65
Total new capital	$125.7	$6,172.4		−15

ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction cost	8/4	672.55	323.29	140.99
	7/28†	672.24	323.15	140.92
Building cost	8/4	478.48	258.65	136.01
	7/28†	478.03	258.41	135.89
Volume	July	699	284	202
	June	633	257	183

† Official monthly indexes for Aug.

One of the many important tunnels driven by Gardner-Denver drills

Exclusively!

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Contractors: Kaiser-Walsh-Perini-Raymond.

Tunnel Data: The longest tunnel ever worked on a single heading —24 x 24 feet. A record performance of tunnel advancement of 401 ft. in 6 working days.

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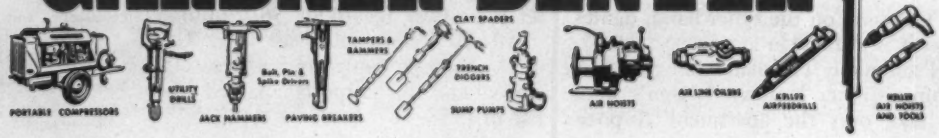
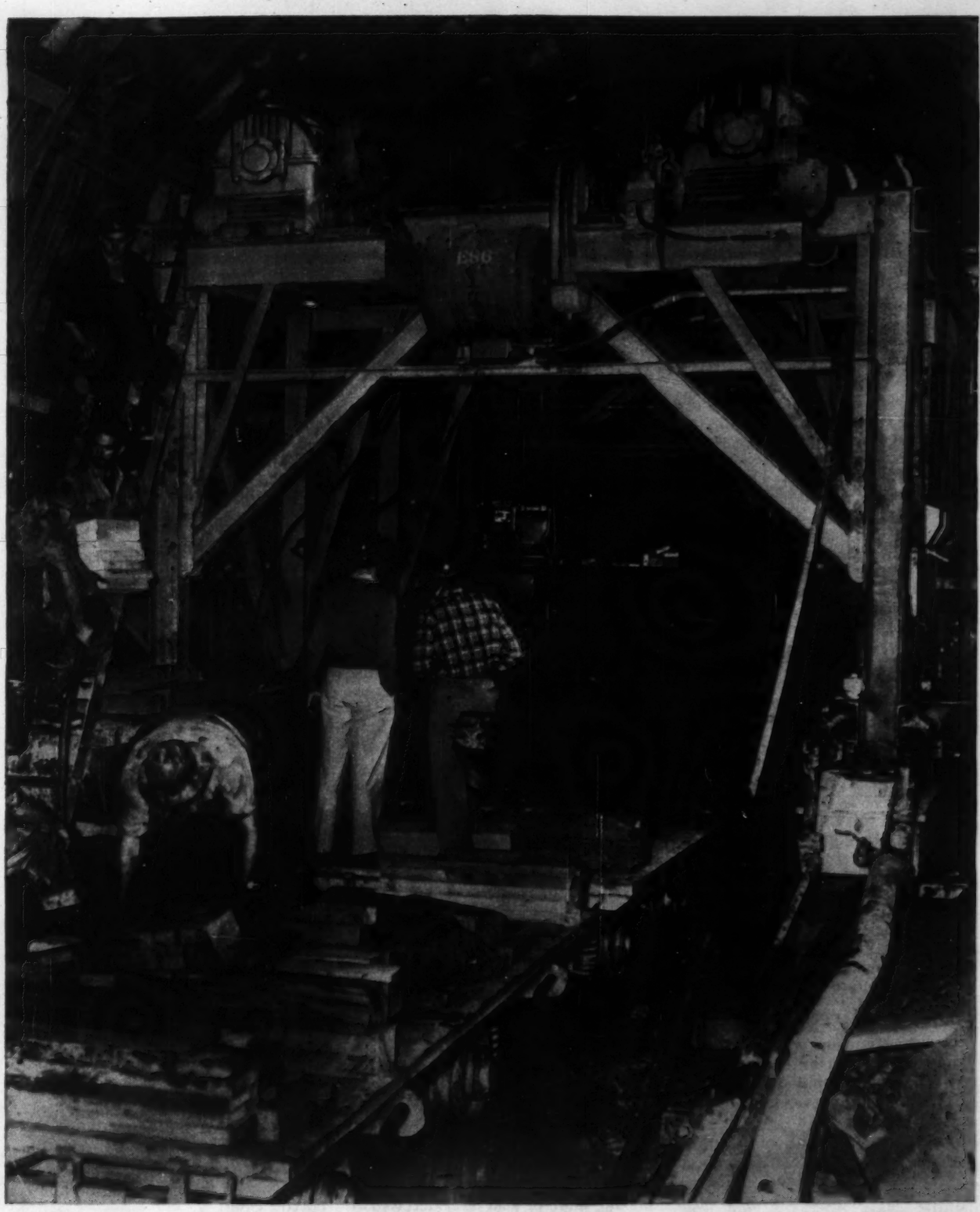
Find out why Gardner-Denver equipment has been first choice for more than 600,000 feet of major tunnel drilling throughout the world in the last five years alone.

GARDNER-DENVER





Gardner-Denver CF93 Drifters, on Gardner-Denver Hydraulic Booms, at work in the Eucumbene-Tumut Tunnel.

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Union Welfare Funds: Some Rate High Praise

Congressional investigation pays tribute to painters and cement unions and emphasizes need of joint administration

In the course of its probe of multi-million-dollar union welfare funds, Congress has singled out the AFL painters and cement unions for special praise in fund operations. But a third —a pointers, cleaners and caulkers local affiliated with the bricklayers— was sharply criticized.

The dual estimates were handed down in an interim report by the Senate labor subcommittee's welfare investigating subcommittee—headed by Illinois Senator Paul L. Douglas. All three plans are operating in Douglas' home state.

Cited for exemplary conduct were both employers and union officials involved in the welfare funds for 26 locals of the Brotherhood of Painters, Decorators and Paperhangers and Local 502 of the Cement Finishing, Rock Asphalt and Composition Floor Finishers Union—both of Chicago.

Condemned for "flagrant disregard" of the law were employer and union representatives operating the fund for members of the Pointers, Cleaners and Caulkers Union Local 52 in Chicago. With testimony indicating that over $200,000 was withdrawn without any accounting, the committee has referrred the case to the Justice Dept. and the Illinois District Attorney for possible prosecution.

Details of the funds were disclosed in lengthy hearings earlier this year by the Douglas investigators. Douglas said the report was issued to "stimulate further interest" in the probe which will continue in the next session of Congress.

Next year, the legislators are expected to come up with a law providing new legal controls of all welfare funds covering millions of workers and running into several billion dollars annually.

These are the details of the three funds as disclosed by Senate probers:

• The Chicago painters and decorators welfare fund covers some 7,000 members of 26 locals. The Chicago painting contractors, with 1,200 employer members pay 7½ cents per employe hour into the fund with group insurance and other related health and welfare benefits going to the workers and their families.

Set up in mid-1953, employers paid nearly $600,000 into the fund the first 12 months, with expenses totaling only 7%, or about $41,000.

Expenses were kept low, the committee said, by the constant supervision of three trustees from management and three from the union. In addition to seeking out advice of skilled consultants for administration and record-keeping, the fund is audited annually with copies going to all the parties.

• The welfare fund of the Cement Mason's Institute of Chicago was set up in 1950 between Local 502 of the union and three employer associations —the Concrete Contractors Association of Greater Chicago, the Builders Association of Chicago and the Illinois Road Builders Association. The fund covers 1,500 employes through payments made by 600 individual employers.

Here again the committee noted the program's success was due to the mutual interest and activity of the 12-member group of trustees, six from each side. Local 502's trust agreement spelled out all the duties, responsibilities and obligations of the trustees and these rules, the committee says, were strictly followed to the point where the fund itself "has helped to make for better relationships between employers and employes."

• Sharp criticism was reserved for Pointers and Cleaners Local 52, its President Edward J. Gallagher, and some 130 employers. Local 52 represents 911 members.

According to the committee report, more than $200,000 was taken from the fund with no explanation by the union "and it is the conclusion of the subcommittee that a great portion of the welfare fund . . . went to the benefit of Gallagher."

Carl Lundgren, president of the 50-member employers association, conceded that no member of his group had participated in the administration of the fund or had ever received a financial accounting. Questioned by the committee on why the employers continued making payments to the fund, he explained it was done in the fear that the members would lose their employes if they didn't, but he admitted the union made no direct threats.

Despite requirement of the Taft-Hartley Act for joint administration of welfare funds, the committee said, "the welfare fund of this union was in the complete control of the union president and operated without any semblance of joint-trusteeship. . . . Whatever local conditions may have been, it is difficult for the subcommittee to understand how 130 employer-contributors to a welfare fund could have allowed themselves to be placed in the position of possible violation of the law. . . ."

What's the Law?

Labor law leaves room for a lot of guessing

Although the courts and the National Labor Relations Board have handed down thousands of decisions during the 20-year history of the National Labor Relations Law and its amendments, there are many areas in which the law remains unsettled. Unions and employers will continue to grope around in a "twlight zone" until their respective rights and obligations are better known.

NLRB chairman Guy Farmer last week described the unsettled fields as "surprisingly large" in number. Among the most significant, he said, are the following:

• Appropriate subject matter, or area, of collective bargaining. The legal question relates to what the employer must permit to be included in contract talks to avoid the charge of refusal to bargain in good faith. What is the limit of the area that has undergone constant expansion? Pension and stock purchase plans, group insurance and bonus payments are examples of present inclusions.

• Legality and effect of "hot cargo" clauses. For instance: Is a contract clause, prohibiting an employer from handling goods of an "unfair" or struck employer valid? Is a strike to obtain such a clause an unfair labor practice? Is it a defense in a secondary boycott case?

• Employe loyalty and the right to concerted activity. When does the right to discharge for employe disloyalty violate labor's right to engage in concerted activity? What are the limits of protection in union-employer fights?

• Use of employer's property for union purposes. Who can use it in

organization drives, and to what extent?

• Strikes prior to contract termination. Does the filing of a 60-day notice make it permissible to call a strike to terminate or modify a contract before its termination date? This far-reaching issue is on its way to the Supreme Court. In the meantime, the fate of long-term contracts is hanging in the balance.

More definite answers to these questions lie in the continuing process of statutory interpretation—until Congress speaks again. And Farmer observed that in these areas neither the language of the law nor the intent of Congress is explicit. In many cases, he said, decisions may be based more on basic policies of the law than on specific statutory language.

Bricklayers End Strike And Win a Bigger Boost

After striking for five weeks and tying up more than $5-million worth of construction, bricklayers in Akron, Ohio, have returned to work under a new two-year contract. The settlement gives the bricklayers a 20-cent package increase—which is four cents larger than that obtained earlier by 17 other building trades.

Under the new agreement, basic rates will be increased 8 cents this year and 12 cents next year. The first hourly increase of 8 cents is retroactive to May 5. The 1956 boost will be paid in three installments of 4 cents each in Jan., May and Sept.

So far no action has been taken to adjust the settlement previously reached with the 17 trades that negotiated jointly for the first time this year. They signed a two-year contract granting an 8-cent boost each year. That agreement was reported to have been accompanied by an understanding that the increases would be adjusted upwards to match whatever higher increases the non-participating building trades might win later.

Kitimat Carpenters Gain Wage Hikes and Overtime

Members of the International Brotherhood of Carpenters and Joiners working on Alcan construction at Kitimat, B. C., have won a new two-year agreement, granting double-time for Saturday overtime and other benefits.

The new contract between Kitimat Local 1081 and Saguenay-Kitimat Construction Co., an Alcan subsidiary, was concluded after 125 carpenters had walked off the job to back up their demands for double-time. The picket lines were honored by 700 other construction workers, halting work at the smelter project.

Strikers were rehired when Bill Page, international union representative, flew to Kitimat to order the men back to work until their position was clarified. Meanwhile a spokesman for the Vancouver Building Trades Council had indicated the strike was illegal. The carpenters were working under a temporary letter of understanding in effect during contract negotiations.

In addition to double-time for overtime on Saturday, the agreement grants a 3-cent wage boost effective next April 1, and holiday pay of 4%.

AFL-CIO Merger May Raise Some Problems Under NLRB

Will the merger of the AFL and CIO into what has tentatively been call the American Federation of Labor and Congress of Industrial Organizations create any problems under the National Labor Relations Act as it is now written?

Situations in which some difficulty is apt to arise are representation and unfair labor practice cases, according to NLRB general counsel Theophil C. Kammholz. He told the Industrial Relations Institute at the University of Wisconsin that any such problems most likely would be only of a transitional nature.

Among the questions which may arise are these: Will certification of a union as exclusive bargaining agent before the merger continue to run in favor of the certified union after the merger? Will the merger affect collective bargaining relationships established by contract or by NLRB orders in unfair labor practice cases?

The answers will depend upon court and board interpretations of the legal effect of the merger. If the proposed constitution, which seeks to preserve the integrity and identity of the affiliating unions is adopted, the problems should not be serious. The proposed merger is expected to be consummated in December. Next week the tentative name for the new organization will come before the AFL Executive Committee in Chicago for approval. The name is reported to have been suggested by AFL president Meany as a compromise and was described by CIO president Reuther as "a happy solution."

California Ties Loose End In Licensing Requirements

Home building in California will become subject on Sept. 7 to new restrictions which promise to cut down on the amount of home construction conducted under non-union conditions.

A 1955 amendment to the Business and Professions Code has tightened up the owner-builder exemption in the Contractors' License Act. Under the new law, the sale of a house by an owner-builder within one year of its completion "is presumptive evidence that such structure was undertaken for purposes of sale"—making the licensing requirements applicable.

The amendment was sponsored by the unions and the home builders who had a common interest in checking abuses of the owner-builders' exemption from the licensing requirements. A union spokesman reported that one Modesto owner-builder has completed 1,000 homes in the last ten years, and that the problem has been particularly acute in northern California.

Under the old law, the exemption was available to owners who had no "intention" of selling at the time of construction.

Labor Briefs . . .

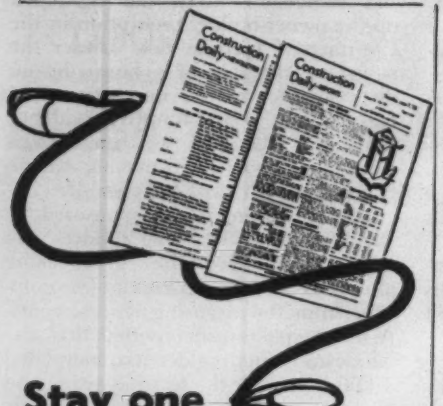
• **Labor objects**—At a committee hearing in Washington recently, organized labor again registered its disapproval of Eisenhower's nomination of Newell Brown, New Hampshire Unemployment Insurance Director, as Federal Wage and Hour Administrator. Labor claims he's a low wage advocate. The nomination has been stalled in committee for over six months.

• **A bird in the hand**—Carpenters in Denver, Colo., have chosen to cancel the 7.2-cent health and welfare contribution they've been getting and to take the pay in cash. Their new one-year contract also grants a 5-cent raise, boosting the pay scale to $2.97½.

• **Unfair competition?**—New York State Industrial Commissioner Isador Lubin has recommended that his state's prevailing wage determinations be required by law to include fringe benefits. Reason: to eliminate the competitive advantage non-union contractors now enjoy under the existing system.

• **Strike settled**—Sheet metal workers in St. Louis, Mo. ended their three-week strike with a two-year contract. The new agreement grants a 1-cent wage boost now—plus 2% of wages for vacation pay—with 8 cents more next July. Present scale, without vacation pay, is $3.35.

• **Frank Duffy**—American labor pioneer Frank Duffy died last month at the age of 94. He helped found the American Federation of Labor, of which he was vice president from 1918 to 1940, and served as secretary of the carpenters union for 48 years.



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OFFICIAL PROPOSALS

Bids: August 22, 1955

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR
CHANNEL IMPROVEMENTS
AT CHIMNEY ISLAND
NEAR OGDENSBURG, ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATION NO. PA-5-11017
ST. LAWRENCE CONTRACT NO. 23

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for Channel Improvements at Chimney Island near Ogdensburg, St. Lawrence County, New York in the following ways:

(1) If brought in person on the day of receiving bids until 10:30 A. M. Eastern Daylight Saving Time on the 22nd day of August, 1955 at 270 Broadway, Hearing Room C on the 6th floor, New York, New York.

(2) If mailed in, until 10:15 A. M. Eastern Daylight Saving Time on the 22nd day of August, 1955 at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The work consists of approximately 1,900,000 cubic yards of river channel dredging in the St. Lawrence River approximately 6 miles east of Ogdensburg, New York.

Bids will be restricted to American bidders. Dredges and other marine plant employed on the work shall be registered or built in the United States.

The work shall be completed on or before November 1, 1957.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) dollars per initial set and Five ($5.00) dollars per set for additional sets, no part of which will be refunded.

Bids must be made in duplicate in accordance with instruction contained in the Information for Bidders. Each proposal must be accompanied by a draft or certified check payable to the order of the Power Authority of the State of New York for the sum of $150,000.00.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

7/29/55

Bids: August 23, 1955

State of New Jersey State Highway Department Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 56 (1927) RT. U.S. 30 (1953), SEC. 3-C

Route 56 (1927) Route U.S. 30 (1953), Sec. 3-C, Absecon Boulevard, Center Island and Turnarounds, City of Absecon, Atlantic County. Length 0.278 miles.

The principal items of work are:

Estimated:

- 204 cu. yds. Roadway Excavation—Earth
- 1,077 sq. yds. Pavement Surface Removal (Bit. Surface)
- 3,790 cu. yds. Borrow Excavation
- 3,351 sq. yds. 4" Topsoiling
- 1,502 sq. yds. Macadam Base Course 7" thick
- 1,091 sq. yds. Class B Grey Conc. Island Pavement
- 165 tons Pavement Type FA-BC-1, 2" thick
- 252 lin. ft. 12" Corrugated Metal Pipe
- 108 lin. ft. 18" Corrugated Metal Pipe
- 6—Inlets Type B

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, August 23, 1955, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by the following documents: (1) a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00; (2) a proposal bond for a sum of not less than fifty percent (50%) of the total price bid for the project; (3) a financial statement (Part 1 of the Prequalification Questionnaire); (4) a plan and equipment statement (Part 3 of the Prequalification Questionnaire) and (5) a Non-collusion Affidavit executed in duplicate; and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:

STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: September 20, 1955

Dearborn-Melvindale Disposal Authority, Dearborn, Michigan

NOTICE TO CONTRACTORS

Sealed bids for the design and construction of a Refuse Incinerator in Dearborn, Mich., will be received at the office of the Chairman of the Authority, Second Floor, Department of Law, Dearborn City Hall, Dearborn, Mich., until 2 p. m. Eastern Standard Time, on September 20, 1955.

Project involves design and construction of a 700-ton per day Refuse Incinerator.

Contract documents may be examined and obtained at above office and office of Metcalf & Eddy, Engineers, 1300 Statler Bldg., Boston, Mass., weekdays except Saturdays and holidays; $100 deposit.

Bid security $75,000 cashier's or certified check; 100% performance and lien bonds required.

BOARD OF TRUSTEES
DEARBORN-MELVINDALE
DISPOSAL AUTHORITY
By Dale H. Fillmore, Chairman

Bids: August 25, 1955

New York State Road Works

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 25th day of August 1955, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

(Continued on opposite page)

New York State Road Works

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, N. F. Rcnan, Acting District Engineer, 353 Broadway, Albany, N. Y.						
Albany	FARC 55-55	Altamont Village, S.H. 849 Dunnsville-Altamont, S.H. 1279 Proj. No. 8427(2)	0.96	9" Cem. Conc. Pavt. 24'-38' Wide.	$18,000 Plans $10	$324,000
Albany	T.C. 55-2	Albany-Watervliet, S.H. 977 Loudonville-Menands, S.H. 1879 Troy-Menands Bridge and Approach, S.H. 9112	0.60	Traffic Signal System	$1,300 Plans $10	23,000
Saratoga	FASH 55-1	Bemis Heights-Schuylerville Proj. No. F391(10)	9.61	9" Cement Concrete Pavt. 24' Wide=9.56 Mi. Misc. Work=0.05 Mi. Comp. I-Beam Bridge 332'	$122,000 Plans $25	$2,212,000
Schenectady	ST 55-4	New York State Thruway-Mohawk Section, Sub. 1-1 (Dahlia Road Extension)	0.40	Bit. Mac. Type 1 (Pen. Method)	$1,100 Plans $10	21,000
Schenectady	M 55-2	Lock 8, Erie Canal, Scotia		New Upper and Lower Gates; Reconstruct a Lower Sill; Plating of Portions of Walls	$9,000 Plans $10	161,544
Washington	FARC 55-57	Thomson-Ft. Edward, Pts. 1 & 2, S.H. 1685A Proj. No. F391(11)	8.93	Asp Conc. Opt.	$45,000 Plans $50	976,000
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Oneida	FGRC 55-64 FARC 55-65 FASH 55-8	Marcy Hill-Trenton, S.H. 931; Trenton-Remsen, S.H. 1144; Trenton-Prospect-Remsen, S.H. 5345; Trenton By-Pass, Proj. F-FG-752(5); S-281(3)	5.61	9" Cement Conc. Pavt. 2 @ 24' Wide=3.69 Miles Asp. Conc., Opt.=1.92 Miles 1 RR Sep. Plate Girder 78 3 Brs. Comp. I-Beams 124', 74' and 175' 1 Br. R. C. Arch 40' 1 Hy. Sep. Comp. I-Beam 147.5'	$180,000 Plans $50	3,268,000
DISTRICT No. 3, Wm. Robinson, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Cortland	FARC 55-58	Blodgett Mills-Cortland, S.H. 881 Proh. F-481(6)	0.18	Asp. Conc., Opt. R.C. Slab Br. Twin 35' Spans	$7,000 Plans $10	120,000
Oswego	FAC 55-15	City of Oswego: East River Road and East First Street Proj. U-583(6)	2.17	9" Cement Conc. Pavt. 24'-48' Wide	$27,000 Plans $10	$486,000
Seneca	O.T. 55-8	New York State Thruway-Ontario Section-Sub. 1 (Junius Pond Gas Station-Restaurant Site)	....	Planting Trees, Shrubs and Vines	$110 Plans $10	2,000
DISTRICT No. 4, B. F. Perry, Acting District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Monroe	FASS 55-1	East River Road (County Road) Proj. S-334(1)	0.56	Asp. Conc., Opt =0.53 Mi. Misc. Work=0.03 Mi. Comp. I-Beam Br. 146'	$12,000 Plans $10	223,000
Orleans	FARC 55-9	Yates-Lyndonville-Ridgeway, S.H. 581 Proj. S-407(1)	1.04	Asp. Conc. Ty. 2A=1.00 Mi. Misc. Work=0.04 Mile	$12,000 Plans $10	224,000
Wyoming	FARC 55-54	Alden-Cowlesville, Pt. 2, S.H. 9040 Bennington-Attica, Pt. 1, S.H. 9042 Proj. S-406(1)	0.70	Asp. Conc., Opt.=0.59 Mi. Misc. Work=0.11 Mile 2 Conc. Box Brs. 27' & 25'	$17,000 Plans $10	286,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo, N.Y.						
Cattaraugus	FARC 55-69	Ellicottville-Machias, Pt. 1, S.H. 9212 Proj. F-603(6)	0.45	Asp. Conc. Opt.=0.25 Mile Misc. Work=0.20 Mile 2 Comp. I-Beam Brs. 66' & 66'	$13,000 Plans $10	232,000
Chautauqua	E.T. 55-4 S.T. 55-6	New York State Thruway-Erie Sect.-Subd. E-1B (Barden Rd. to Westfield) and 5 Marginal or Cross Roads	5.32 (Acc.) (1.94)	Two crse. Cement Conc. Pavt.=5.12 Mi. Cement Conc. Pavt. Br.=0.12 Mi. Bit. Mac. Ty. 1=1.44 Mi. B.S.T. Graded Grav.=0.48 Mi. Misc. Work=0.06 Mi. 4 Hy. Seps. Comp. I-Beams 338.2', 275.5', 364.5' & 412.3' 1 R.C. Rig. Fr. Br. 62.8' 1 Comp. I-Beam Br. 430'	$272,000 Plans $100	4,950,000
Chautauqua	E.T. 55-5 S.T. 55-7	New York State Thruway-Erie Sect.-Subd. E-2A (Westfield to West Forest Road); Westfield Interchange and 3 Secondary Cross Roads	4.73 (Acc.) (2.88)	Two Crse. Cem. Conc. Pavt.=6.32 Mi. Cem. Conc. Pavt. Br.=0.13 Mi. Asp. Conc. Ty. 2B=0.25 Mi. Bit. Mac. Ty. 1=0.63 Mi. Misc. Work=0.28 Mi. 5 Hy. Seps. Comp. I-Beams 249.8', 254.3', 257.4', 192' & 184.6'	$215,000 Plans $100	3,925,000
Erie	E.T. 55-3 S.T. 55-5	New York State Thruway-Erie Sect.-Subd. E-7B (Shadagee Road and Eighteen Mile Creek Bridge and Approach); Shadagee Road,	0.40	Two Crse. Cem. Conc. Pavt.=0.17 Mi. Cem. Conc. Pavt. Br.=0.12 Mi. Asp. Conc. Opt.=0.11 Mi. Deck Girder Br. 652' NB and 630' SB	$110,000 Plans $15	1,941,000
Erie	E.T. 55-6 S.T. 55-8 R.C. 55-71	New York StateThruway-Erie Sect. Subd. E-8A(Camp Road to Bayview Road); Camp Road Interchange; Athol Springs-Hamburg, S.H. 1067; Buffalo-Hamburg, S.H. 2, and 3 Secondary Cross Roads	2.33 (Acc.) (4.59)	Two Crse. Cem. Conc. Pavt.=5.52 Mi. Cem. Conc. Pavt. Br.=0.25 Mi. Asp. Conc. Opt.=0.99 Mi. Misc. Work=0.16 Mi. 5 Hy. Seps. Comp. I-Beams 260.5', 291.5', 254.8', 355.8' and 158.7'	$185,000 Plans $50	3,350,000
Niagara	FARC 55-68 FASH 55-9	McNalls-Alabama, Pt. 1, S.H. 9338 McNalls-Alabama, Pt. 1A, Proj. S-457(1)	3.88	Asp. Conc., Opt.=3.85 Mi. Misc. Work=0.03 Mi.	21,000 Plans $15	380,000
Niagara	FARC 55-61	North Tonawanda-Sanborn, Pts. 1 & 2 S.H. 643 Proj. S-390(1)	3.15	Asp. Conc., Opt.=3.13 Mi. Misc. Work 0.02 Mi. Widening Exist'g. R.C. Slab Br.	$28,000 Plans $15	482,000
Erie & Niagara	M 55-3	Bush's Bridge E-243 East Robinson Street Extension	0.40	Asp. Conc. Opt.=0.21 Mi. Misc. Work=0.19 Mi. Plate Girder Br. 351'	$26,000 Plans $25	472,400
DISTRICT No. 6, J. H. Thomas, District Engineer, 30 West Main St., Hornell, N. Y.						
Chemung	FASS 55-6	Chemung-Van Etten, C.R. 3 Proj. S-86(3)	1.71	Bit. Double Surface Treatment 2 Comp. I-Beam Brs. 60' & 60'	$19,000 Plans $15	345,000
Steuben & Yates	FARC 55-62	Wayne-Keuka-Penn Yan, Pt. 1, S.H. 1779 Keuka-Penn Yan, Pts. 2 & 3, S.H. 8435, 8523 Proj. F-529(6)	8.62	Asp. Conc., Opt. I-Beam Br. 34' (Widen)	$90,000 Plans $50	1,553,000
Tioga	FASS 55-2	Berkshire-East Berkshire, Co. Rd. 202 Proj. S-302(1)	0.14	F.C. Grav. Bit. D.S.T. Comp. I-Beam Br. 158'	$7,500 Plans $10	136,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee St., Watertown, N. Y.						
St. Lawrence	FARC 55-70	Gouverneur-Edwards, Pts. 1 & 2 S.H. 1263-1389 Proj. S-441(1)	3.96	Asp. Conc., Opt.=3.74 Mi. Misc. Work=0.22 Mi.	$40,000 Plans $25	727,000
St. Lawrence	FASH 55-7 FARC 55-60	Massena South Side Route, Pt. 2 (Contract 1) Massena-Helena, Pt. 1, S.H. 1261 Proj. U-UG-580(9)	5.02	Asp. Conc., Opt.=5.00 Mi. Misc. Work=0.02 Mi. RR Sep. I-Beam 205.3'	$90,000 Plans $25	1,651,000
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Orange	C.T. 55-9	New York State Thruway-Catskill Section-Subd. 6 (Harriman Maint. Bldg. Site)	....	Grading, Paving & Misc. Work	$2,500 Plans $10	44,000
Orange	C.T. 55-10	New York State Thruway-Catskill Section-Subd. 5 (Newburgh Maint. Bldg. Site)	....	Grading, Paving & Misc. Work	$2,800 Plans $10	48,000
Putnam	FARC 55-66 FGRC 55-67	Brewster-Carmel, S.H. 909 Proj. F-FG-590(2)	2.09	9" Cem. Conc. Pavt. 24' Wide=2.05 Mi. Misc. Work=0.04 Mi. Comp. I-Beam Br. 130' RR. Sep. Comp. I-Beam 180'	$60,000 Plans $15	1,112,000
Rockland	FARC 55-56	Suffern-Mt. Ivy, S.H. 1448 Proj. F-637(3)	1.60	9" Cem. Conc. Pavt. 24' Wide=1.58 Mi. Misc. Work=0.02 Mi.	$35,000 Plans $10	644,000
Ulster	FASS 55-4	Rosendale-Tillson, C.R. 113 Proj. S-423(1)	0.08	Asp. Conc., Opt. Comp. Girder & R.C. Slab Br. 153.3'	$15,000 Plans $10	275,000
Westchester	H.T. 55-6	New York State Thruway-Hudson Section-Subd. 10 (Ardsley Gas Station-Restaurant Site) (Type CM)	....	Grading, Paving & Misc. Work	$9,000 Plans $10	156,000
DISTRICT No. 9, F. W. Donovan, District Engineer, 71 Frederick St., Binghamton, N. Y.						
Delaware, Otsego, & Schoharie	R.C. 55-59	Br. No. 1 & Br. No. 2, S.H. 982; Br. No. 1, S.H. 5384; Br. No. 2, S.H. 239; Br. No. 1, S.H. 987-A; Br. No. 1, S.H. 5195; Br. No. 2, S.H. 8270; Br. No. 1, S.H. 1215; Br. No. 1, S.H. 5458	....	Cleaning & Painting 9 Bridges	$1,500 Plans $10	26,000
Sullivan	R.C. 55-63	Narrowsburg-Callicoon, Pt. 3, S.H. 8449 Callicoon-Long Eddy, Pt. 2, S.H. 8494	0.32	Repair, Clean & Paint 2 Bridges	$2,500 Plans $10	46,000
DISTRICT No. 10, M. E. Goul, District Engineer, Montuck Highway at Little East Neck Road, Babylon, L. I., N. Y.						
Bronx	FACBE 55-1	Cross Bronx Expressway Cont. 1C (Anthony Ave.-Longfellow Ave.) Proj. IN-1084(21)	1.22	Demolition of Buildings	$40,000 Plans $10	760,000
Nassau	PSC 7278-8966	Elimination of Grade Crossings of the Long Island Railroad with Various Streets in the Hamlet of Baldwin and Village of Freeport	0.35 (1.56) (RR)	Railroad Relocation=1.56 Mi. Asp. Conc. Opt.=0.26 Mi. Cem. Conc. Pavt.=0.09 Mi. 4 Plate Girders 80', 85.5', 60' & 76.5' 1 Viaduct and Station 920'	182,000 Plans $100	3,337,000

(Continued on following page)

OFFICIAL PROPOSALS

New York State Road Works

(Continued from preceding page)

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions apply to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: August 22, 1955

Construction of Main Sewer and Main Drain Lakevilla Drive District, Springfield, Mass.

NOTICE TO SEWER CONTRACTORS

Sealed bids for constructing main sewer and main drain in Lakevilla Drive District will be received at Room 326, City Hall, Springfield, Mass., until 12:00 noon Eastern Daylight Saving time on Monday, August 22, 1955.

Project involves about 4,000 ft. of sewer varying in size from 18 in. to 30 in.; 2,180 ft. of reinforced-concrete drain varying in size from 30 in. to 60 in.; manholes, junction chambers, and appurtenant work.

Drawings and documents may be examined and obtained at office of Superintendent of Department of Streets and Engineering, City Hall, Springfield, Mass.; $10.00 deposit.

Bid security: certified check or bid bond for 5% of bid price; successful bidder must furnish 100% performance bond.

Minimum wage rates and employment conditions on public work are applicable. The right is reserved to reject any or all bids or to accept any bid deemed for the interest of the City so to do.

CITY OF SPRINGFIELD,
MASSACHUSETTS
By its BOARD OF SUPERVISORS
DEPARTMENT OF STREETS AND ENGINEERING
James J. Sullivan
Superintendent

Bids: September 6, 1955

Contract PN-280.001

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
REHABILITATION OF BULKHEAD

Sealed proposals for the rehabilitation of a portion of the bulkhead on the south side of City Channel at Port Newark, New Jersey will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, September 6, 1955, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, August 11, 1955

Bids: August 24, 1955

Proposal No. 658

THE PORT OF NEW YORK AUTHORITY
TWO (2) DUMP TRUCKS EQUIPPED WITH SNOW PLOWS
NEWARK AIRPORT AND GEORGE WASHINGTON BRIDGE

Sealed proposals for furnishing two (2) dump trucks equipped with Snow Plows for Newark Airport and the George Washington Bridge will be received at the office of the Director of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Ave., New York 11, until 11:00 A.M. (E.D.T.) on Wednesday, August 24, 1955, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase and Administrative Services.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

Bids: August 30, 1955.

New Jersey Turnpike Authority

CONTRACT NO. N-30B

Proposals are invited for Contract No. N-30B which involves the installation of roadway lighting facilities, including three transformer stations, from the east abutment of the Newark Bay Bridge just west of Hudson Boulevard in the City of Bayonne, Hudson County, to the south side of the Holland Tunnel Interchange (Communipaw Avenue Toll Plaza which is located just south of Communipaw Avenue in Jersey City, Hudson County, all in connection with the construction of the Newark Bay-Hudson County Extension of the New Jersey Turnpike.

The principal items of work include:

Trenching and Backfilling	35,700 Lin. Ft.
Asbestos-Cement Conduit	39,000 Lin. Ft.
Galvanized Wrought Iron Conduit	1,700 Lin. Ft.
Series Lighting Conductor	63,900 Lin. Ft.
Lighting Standards & Luminaires	235 Units
Transformer Stations	3 Units

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock Eastern Daylight Saving Time on the morning of August 30, 1955, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after August 10, 1955, at the office of the Authority and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Contract documents will be furnished upon payment of Ten Dollars ($10.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

August 5, 1955

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4493) will be received at Denver, Colorado, until September 1, 1955, for furnishing one 72-inch diameter steel outlet pipe approximately 1,000 feet long; and one steel walkway with handrail approximately 900 feet long, for Tiber Dam, Marias Division, Lower Marias Unit, Montana, Missouri River Basin Project. Delivery is desired within 150 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

SEARCHLIGHT SECTION

This index is published as a convenience to the reader. Every care is taken to make it accurate but SEARCHLIGHT SECTION assumes no responsibility for errors or omissions.

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OFFICIAL PROPOSALS

Bids: August 23, 1955

New Jersey Turnpike Authority

CONTRACT NO. 113

Proposals are invited for Contract Nos. 113, 113A, 113B and 113C which involve miscellaneous grading, drainage, paving and other incidental alteration work at Interchange 1 (Contract 113A), at Interchange 2 (Contract No. 113B) and at Interchange 3 (Contract No. 113C), all along the New Jersey Turnpike in Salem and Camden Counties, New Jersey. Contract No. 113 comprises all the work required under Contract Nos. 113A, 113B and 113C.

The principal items of work for Contract Nos. 113A, 113B and 113C include:

	Contract No. 113A	Contract No. 113B	Contract No. 113C
Roadway Excavation Shoulder Pavement, Sq. Yds.	10,500	8,300	13,750
4" Topsoil, Sq. Yds.	14,300	10,600	11,700
Seeding, Sq. Yds.	17,000	13,000	27,000
Subbase, 4" Thick, Type D, Sq. Yds.	1,200	575	700
Subbase, 6½" Thick, Type C, Sq. Yds.	10,500	8,250	13,700
Penetration Macadam Base Course, 4" Thick, Sq. Yds.	1,200	575	700
Penetration Macadam Base Course 7½" Thick, Sq. Yds.	9,100	6,875	11,750
Asphaltic Concrete Pavement, 3" Thick, Sq. Yds.	1,200	575	700
Asphaltic Concrete Pavement, 4½ Thick, Sq. Yds.	10,100	7,550	12,900
Storm Drain, Reinforced Concrete Pipe, Lin. Ft.	760	1,900	2,775
Inlet, Type D-4, Units	30	27	55
Curbs, Lin. Ft.	12,950	9,000	15,200

The principal items of work for Contract No. 113 equal the sum of the quantities listed for Contract Nos. 113A, 113B and 113C. If a bidder submits a proposal for Contract No. 113, he must also submit proposals for Contract Nos. 113A, 113B and 113C.

Proposals will be received at the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock, Eastern Daylight Saving Time, on the morning of August 23, 1955, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after August 8, 1955, at the office of the Authority and at the office of the Consulting Engineers, Sherman, Taylor & Sleeper, Park and Norwood Avenues, Merchantville, New Jersey. Contract documents will be furnished upon payment of Ten Dollars ($10.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

August 2, 1955

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal Advertising is $1.80 per line (or fraction) per insertion.

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SEND COPY: to Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

OFFICIAL PROPOSALS

COMMONWEALTH OF MASSACHUSETTS. Department of Public Works. NOTICE TO CONTRACTORS: POSTPONING OPEN-OF BIDS. BOSTON: Tunnel, North Approach thereto and Miscellaneous Work John F. Fitzgerald Expressway (Contract KL) From—TUESDAY, AUGUST 23, 1955 to TUESDAY, SEPTEMBER 13, 1955 (Subbids from Thursday, August 18, 1955 to Thursday, September 8, 1955) By: JOHN A. VOLPE, Commissioner of Public Works. August 6, 1955.

Bids: August 23, 1955

New Jersey Turnpike Authority

CONTRACT NO. 112

Proposals are invited for Contract Nos. 112, 112A, 112B and 112C which involve miscellaneous grading, drainage, paving and other incidental alteration work at Service Area 1S (Contract No. 112A), at Service Area 1N (Contract No. 112B) and at Service Area 3S (Contract No. 112C), all along the New Jersey Turnpike in Salem and Camden Counties, New Jersey. Contract No. 112 comprises all the work required under Contract Nos. 112A, 112B and 112C.

The principal items of work for Contract Nos. 112A, 112B and 112C include:

	Contract No. 112A	Contract No. 112B	Contract No. 112C
Roadway Excavation Shoulder Pavement, Sq. Yds.	2,950	3,000	2,600
4" Topsoil, Sq. Yds.	10,000	7,000	10,500
Seeding, Sq. Yds.	12,000	9,000	12,500
Subbase, 4" Thick, Type D Sq. Yds.	7,600	4,700	6,200
Subbase, 6½" Thick, Type C, Sq. Yds.	2,950	3,000	2,600
Penetration Macadam Leveling Course, 2" Min. Thickness, Sq. Yds.	4,400	4,600	5,550
Penetration Macadam Base Course, 4" Thick, Sq. Yds.	13,500	5,500	11,000
Penetration Macadam Base Course, 7½" Thick, Sq. Yds.	2,600	2,600	2,300
Asphaltic Concrete Pavement, 3" Thick, Sq. Yds.	12,500	9,000	12,000
Asphaltic Concrete Pavement 4½" Thick, Sq. Yds.	3,000	3,000	2,500
Oil Resistant Seal Coat for Asphaltic Concrete Pavement, Sq. Yds.	10,500	9,500	9,600
Storm Drain, Reinforced Concrete Pipe, Lin. Ft.	950	900	1,855
Inlet, Type D-4 Units	24	21	23
New Lighting Facilities, Lump Sum	1	1	1
White Line Pavement Marking, Lin. Ft.	3,700	4,500	4,000
Curbs, Lin. Ft.	8,000	7,000	6,100

The principal items of work for Contract No. 112 equal the sum of the quantities listed for Contract Nos. 112A, 112B and 112C. If a bidder submits a proposal for Contract No. 112, he must also submit proposals for Contracts Nos. 112A, 112B and 112C.

Proposals will be received at the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock, Eastern Daylight Saving Time, on the morning of August 23, 1955, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after August 8, 1955, at the office of the Authority and at the office of the Consulting Engineer, Sherman, Taylor & Sleeper, Park and Norwood Avenues, Merchantville, New Jersey. Contract documents will be furnished upon payment of Ten Dollars, ($10.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

August 2, 1955

OFFICIAL PROPOSALS

Bids: August 30, 1955

New Jersey Turnpike Authority

CONTRACT NO. N-61A, N-61B, N-61C and N-61D

Sealed proposals are invited for Contract Nos. N-61A, N-61B, N-61C and N-61D in connection with the service building at Service Area ES, Jersey City, on the Newark Bay-Hudson County Extension of the New Jersey Turnpike, in Hudson County, as follows:

Contract No. N-61A—General Construction
Contract No. N-61B—Plumbing
Contract No. N-61C—Heating, Ventilating and Air Conditioning
Contract No. N-61D—Electrical Work

Proposals will be received at the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock, Eastern Daylight Saving Time, on the morning of August 30, 1955, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after August 4, 1955, at the office of the Authority, and at the office of the Consulting Architects, Lorimer & Rose, 254 W. 54th Street, New York 19, New York. Contract documents will be furnished upon payment of Fifteen Dollars ($15.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

August 2, 1955

Bids: September 1, 1955

Delaware River Joint Toll Bridge Commission

Administration Building
Morrisville, Pennsylvania

NOTICE TO CONTRACTORS

Sealed proposals will be received by the Delaware River Joint Toll Bridge Commission until eleven o'clock A. M., Eastern Standard Time, September 1, 1955, for all labor, material, tools and equipment required for painting parts of the steel superstructure, in general the trusses of the main span, of the toll bridge across the Delaware River between Easton, Pennsylvania-Phillipsburg, New Jersey.

Proposals must be submitted on the form furnished by the Commission, and each proposal shall be accompanied by a certified check in the amount of Two Thousand Dollars ($2,000.00) made payable to the "Treasurer of the Delaware River Joint Toll Bridge Commission", as a guarantee of good faith.

Specifications are on file at the offices of the Commission, in the Administration Building, Morrisville, Pennsylvania, and in the Administration Building, Phillipsburg, New Jersey, and can be obtained upon application.

All proposals shall be submitted in separate sealed envelopes, each marked "Proposal for Painting the Easton, Pennsylvania-Phillipsburg, New Jersey Bridge", and forwarded only to the office of the Comptroller of the Commission, in the Administration Building, Morrisville, Pennsylvania.

The right is reserved to reject any or all bids; to waive any informality in the bids received; and to award the contract only to those experienced in the class of work and to the bidder (or bidders) whose proposal is deemed by the Commission to be most advantageous to the public interest.

DELAWARE RIVER JOINT
TOLL BRIDGE COMMISSION
By:
Doris S. Jones
Secretary of Commission

Date: July 29, 1955.

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work

Civil Service Opportunities....
Selling Opportunities Wanted
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Send NEW ADS to ENGINEERING NEWS RECORD, 330 W. 42nd St., N. Y. 36, N. Y. for August 25th issue closing August 15th

REPLIES (Box No.): Address to office nearest you
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CHICAGO: 520 N. Michigan Ave. (11)
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POSITIONS VACANT

Construction Foreman for firm engaged in extensive sewer, water main and treatment plant facilities. Permanent position in N. Y. State area. Only qualified applicants with broad experience. P-6595, Engineering News-Record.

Wanted: Instructor in engineering drawing and descriptive geometry. Salary $3600 for 9 month period. Dept. of Engr. Drawing, University of North Dakota, Grand Forks, North Dakota.

Assistant Engineers, civil engineering back-ground. Training and experience in one or more of the following: design of subdivisions, sewers, water mains, streets, etc. for career positions in consulting engineer's office. Salary open. State education, experience, salary requirements and give references. Lester V. Johnson Associates, 2309 Wilson Boulevard Arlington, Virginia.

Engineers—Experienced in design and pre-paration of plans for water works and sewerage systems and structural design. Advise education, experience, salary requirements and when available. Location Eastern New York. Reply P-7171, Engineering News-Record.

Architect—Qualified through training and experience to design churches, schools and other buildings. Give full information as to education, experience, salary requirements and when available. Location Eastern New York. P-7172, Engineering News-Record.

Wanted: Instructor and Half-time graduate assistants in engineering drawing and/or mechanics subjects. Opportunity to earn advanced degrees. Write: Head, Department of Civil Engineering, Lehigh University, Bethlehem, Pennsylvania.

Sanitary Engineer. Graduate engineer with broad and recent water works and sewerage design experience for consultant's office located in Ohio. Permanent position intended. Write fully regarding experience, age and ability to manage engineering personnel. Salary open. P-7184, Engineering News-Record.

Construction Superintendent—Immediate em-ployment. Must be capable of taking complete field charge of $3,000,000 school project. State experience and references. Location—North Eastern Ohio. Salary open. P-7198, Engineering News-Record.

Univ. of Colorado, Boulder, instructor, M.S. or B.S. degree. Opportunity for graduate work. C. E. Dept.

Wanted—First-class structural and plate draftsman. Very desirable living conditions, southern city. Give full information as to experience and expected remuneration in reply. P-7231, Engineering News-Record.

Cost Analyst for engineering dept. planning group. Graduate Engineer—construction cost & engineering background. Analytical min, personality, initiative, are important. Location: Southwest Ohio. P-7229, Engineering News-Record.

Civil Engineer—qualified to design and to prepare specifications and cost estimate for earth dams and appurtenances. Location, Ohio. P-7230, Engineering News-Record.

POSITIONS VACANT

Sales Manager for manufacturer of concrete form accessories. Must be experienced in construction practices, read prints. Qualified to organize and supervise sales for national coverage. Give full details including salary expected in first letter. Opportunity of lifetime for right man. P-7236, Engineering News-Record.

Engineer with executive ability and estimat-ing and field experience in pile driving to manage foundation construction operations. Permanent position Pennsylvania location. Write stating qualifications and salary. Replies confidential. P-7247, Engineering News-Record.

Engineer-Superintendent for heavy excava-tion and grading on roads, airports, etc. Must be graduate engineer between 30-40 years old who has been actively engaged in actually doing this type of work for at least the last five years in the capacity. This is a permanent position with a substantial company in New York State. This opening has a real future for the right man. Salary open. P-7106, Engineering News-Record.

Draftsmen—Junior and Senior Architectural. Excellent future for qualified men. State age, education, experience, references and salary expected. Warren Holmes Company, 2200 Michigan National Tower, Lansing 8, Michigan.

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Sanitary Engineer. Experienced in design and preparation of plans and specifications for water and sewerage plants. Permanent position. Location, South Florida. P-7297, Engineering News-Record.

Construction Engineer for general contractor doing engineering type construction. We want a man that has growth possibilities and wants to get ahead. P-7295, Engineering News-Record.

Construction Superintendent for heavy con-struction job. Send resume with your requirements. P-7296, Engineering News-Record.

Bridge Engineer (Structural) Nationally-known construction firm specializing in foundation and concrete construction desires structural engineer with experience in bridge and cofferdam designing. Must be able to contact consultant and designing engineers in promotional work. Complete details and photograph should accompany letter of application. Address reply to P-7294, Engineering News-Record.

Construction Superintendent—General Con-tracting firm operating in West Virginia, Maryland and Pennsylvania, specializing in the construction of commercial and public buildings, desires man for project superintendent. Engineering background preferred. Must have references to demonstrate that he has administrative ability and can handle all phases of work required by the project. Reply giving age, resume of experience and salary required. P-7292, Engineering News-Record.

Civil Engineer, graduate, experienced as chief of field party in building construction work. Location in New England. P-7316, Engineering News-Record.

POSITIONS VACANT

Master Mechanic Wanted must be expe-rienced in heavy construction equipment of all types. Good opportunity with established contractor, in Southwestern Pennsylvania. Send complete resume, with name, address and salary requirements. P-7313, Engineering News-Record.

Wanted—Experienced sand and gravel man. Must be able to set up plant and produce sand and screened and crushed gravel from river deposit. Work in Northwest. Give full particulars. P-7310, Engineering News-Record.

POSITIONS WANTED

Heavy Construction Manager. Thoroughly qualified in field, and office 26 years experience hydro. and steam plants, dams, tunnels and airbases. Construction wide, and cost-conscious now employed. Have had foreign experience. PW-7126, Engineering News-Record.

Civil Engineer, 15 years field experience, in-dustrial and commercial buildings desires position in office of general contractor, estimating, purchasing, etc. midwest location. PW-7199, Engineering News-Record.

Purchasing Agent: traffic, expediting, field office mgr., contract-negotatn, renegotatn & admnstrn, controls, costs, A-E liaison; nations top contrs. 20 yrs. private competitive & 10 yrs. FF Gov't wk. AEC Ptsmth, Paducah & Ridge Q cleared. Prefer ntheast. PW-7235, Engineering News-Record.

Electrical engineer, supervisory. Turbo- and diesel-electric power plants and municipal distribution systems; industrial and military applications; control and instrumentation; industrial electronics; radio communication plants. Master planning, design, construction, testing, administration. 15 yrs. N.Y.C. public utilities, 5 yrs. U.S. Navy, 5 yrs. architect-engineers. Versatile and adaptable. Foreign or domestic. Available immediately. F. E. Bruckmann, River Road, RFD 1 Norwood, N. Y. Telephone Potsdam 5308.

Civil Engineer, BSCE Assoc. Mbr. ASCE. Chief highway designer; general contractors engineer; and university instructor. Military service as resident engineer; post engineer and const.-est. engineer. Desire permanent location. PW-7299, Engineering News-Record.

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Construction Engineer, registered CE, 13 yrs construction, 12 yrs industrial with plant engineering, purchasing, estimating and cost experience, seeks opportunity with midwest contractor. PW-7260, Engineering News-Record.

Supervisory position wanted. Contractors superintendent, engineer, or owners, architects or engineers representative. 30 yrs. experience planning and supervising construction work for buildings, bridges, highways, miscellaneous structures. Estimating, costs. Available immediately. PW-7321, Engineering News-Record.

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P-7054, Engineering News-Record
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P-7062, Engineering News-Record
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P-7277, Engineering News-Record
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P-7320, Engineering News-Record
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Please send complete experience record, references, date available and salary desired in first letter.

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P-7225, Engineering News-Record
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P-7224, Engineering News-Record
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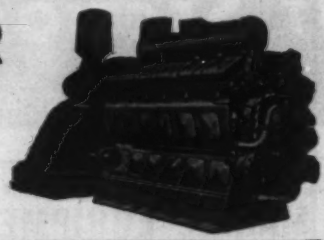

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750	General Motors	12-567	1080	720	200	General Motors	8-268A	350	900
700	Worthington	EE-8	1000	327	175	General Motors	12-71	275	1800
675	Fairbanks Morse	38D	960	720	150	Buckeye	80	240	600
500	General Motors	8-567	720	720	148	Fairbanks Morse	32E14	220	300
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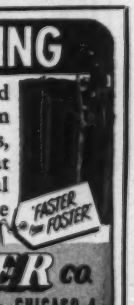

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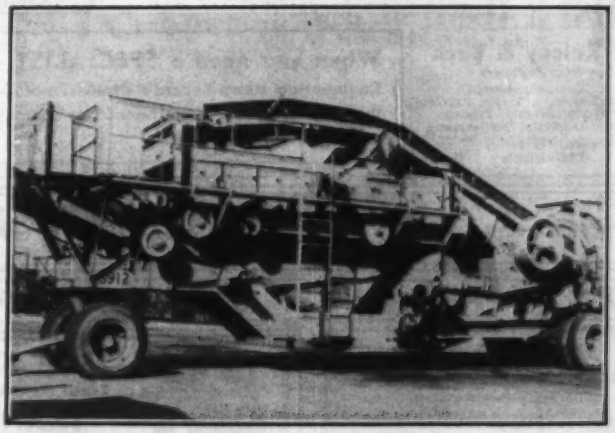

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EDITORIALS

Interchanges With Russia

THE APPARENT SUCCESS of the current visit of Russian farmers to our Middle West will unquestionably lead to proposals for other Soviet groups to come to the U.S., and for return visits of parallel U.S. groups to Russia. Such an idea was, in fact, discussed and agreed to at the recent Big Four session in Geneva. President Eisenhower in his July 25 radio talk to the nation referred specifically to such visits, and said that on "this particular subject there was the greatest possible degree of agreement."

From this broad statement of principle to a specific proposal for two-way visits of U.S. and Soviet engineers, architects and construction men is only a short step. Is the ground well enough prepared for such visits to be profitable, and if not what is lacking?

When one comes to consider these questions it is natural to hark back to earlier attempts at cooperation in the realm of building and construction—not to harp on the failures, but to seek out changes that could make future cooperation more fruitful.

The first attempt at improved contacts occurred shortly after the war when a number of leading U.S. architects and engineers were importuned to form committees to promote a freer exchange of technical information between the two countries. Such an exchange had always been the normal road of advance for world technology, and it existed as a matter of course among all the nations of the world. But the Soviets, after the war, had erected a barrier against this normal procedure, so some special means of penetrating it in the interests of technical advance and friendly relations seemed desirable.

The meetings of the committees early disclosed, however, that the Soviets were more interested in propaganda than in a sincere interchange of information. The types of technical papers and articles Soviet engineers were permitted to write for world consumption disclosed this fact and not much else. There was some talk of sending exhibits of models and pictures of engineering structures back and forth between the two countries, but after one U.S. architectural exhibit was sent Soviet procrastination killed this idea.

Not long after the U.S. committees were formed, therefore, they gave up, their members wanting no part of the ballyhoo and communist propaganda that could be foreseen. That they were more than right was proved a few years later when the organization which had urged their creation, the National Council of American-Soviet Friendship, was declared to be subversive.

In more recent years Soviet delegations have attended various international engineering congresses abroad. There has been an improvement in the ratio of technical information to propaganda in the papers they present, but the individual delegates seldom take part in the useful off-the-cuff discussions. The Soviet delegates, also, while collectively friendly, stay close together in a group, which does not foster individual friendships or free and easy exchange of technical ideas. Even though language is a barrier, the Soviet delegations seem to make little effort to be other than outsiders at such gatherings.

It would therefore seem that if more successful contacts are to result the Soviets will have to forego their propaganda efforts, put more on the line in reporting their engineering projects and technical research, and place their contacts with foreigners on an individual rather than a group or formal delegation basis. The U.S., as President Eisenhower proved at Geneva, wants to go more than halfway in improving friendly relations with Russia. American engineers, architects, and construction men can be counted on to have the same attitude if the same normalcy in contacts can be instituted with the Soviets as exists between Americans and their technological counterparts in other nations.

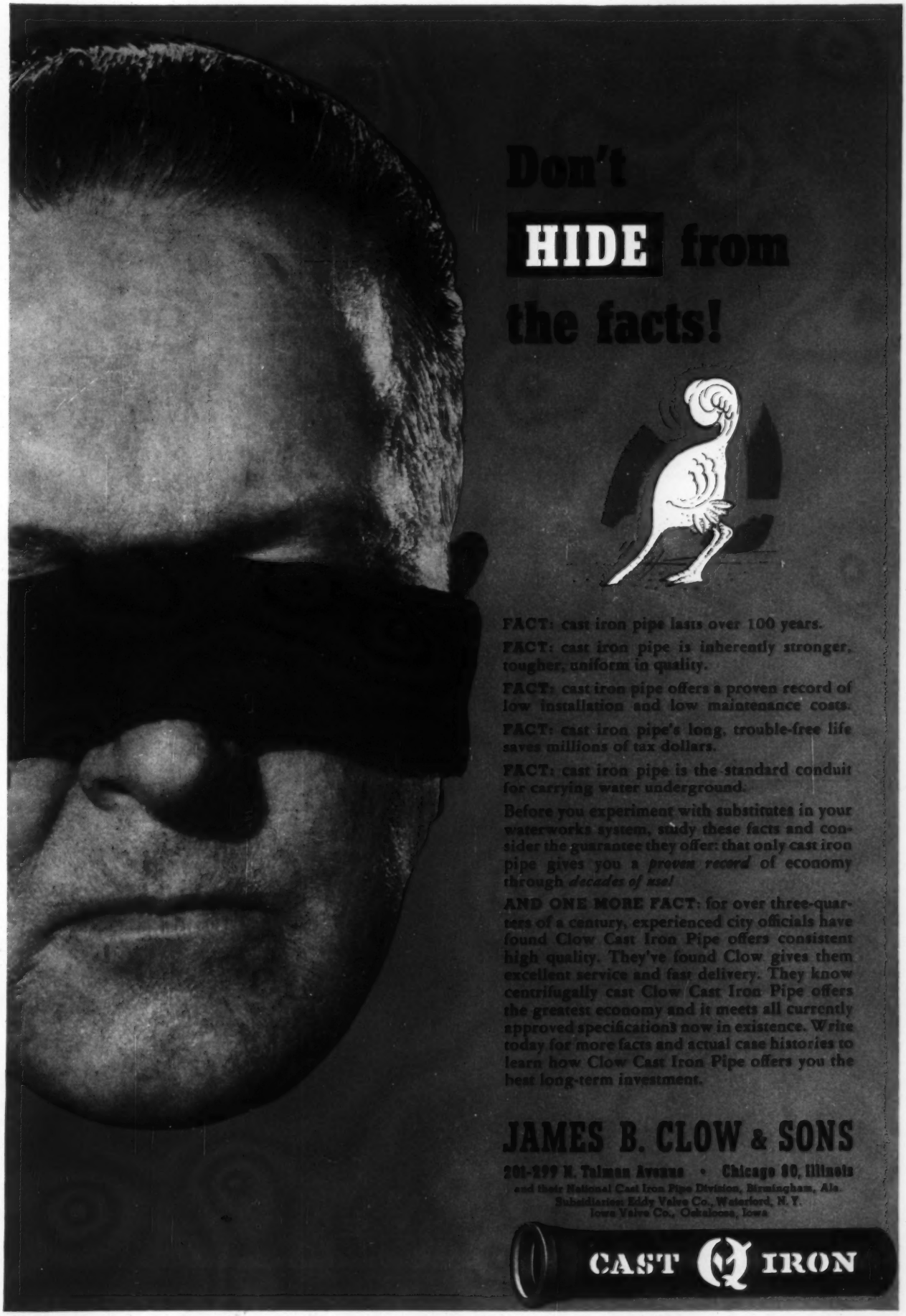
Something like this kind of a change in the atmosphere would seem to be called for as a prerequisite to action on proposals for an exchange of visits by representatives of the Soviet and American construction industries.

Effective Ambassador of Science

GUSTAVE MAGNEL, the Belgian professor and prestressed concrete expert who died last month, was, for a foreigner, uncommonly well-known in the U.S. And with good reason, for he had uncommon character and ability. A warm personality, flavored by peppery delivery of his ideas which he expounded with a school teacher's innate desire to be understood, made him a favorite with all who came in contact with him.

Along with Eugene Freyssinet of France, Professor Magnel developed the science of prestressed concrete to the point where its practitioners exist in every country of the world. Moreover, it was Professor Magnel who designed the first major prestressed concrete structure in the U.S.—Philadelphia's Walnut Lane Bridge. And at the time of his death he had just completed the design of the world's tallest structure—a 1,639 ft concrete tower proposed for the international exposition being planned for Brussels in 1958.

Despite his significant works, however, Gustave Magnel will longer be remembered for his words—caustic when he spoke of technical shortcomings, as for example too-wet concrete; quietly eloquent when he explained his engineering ideas or spoke of conditions in Belgium—technical, economic or political. He was always an efficient ambassador of science for his country. Other countries, including the U.S., have need of ambassadors like him.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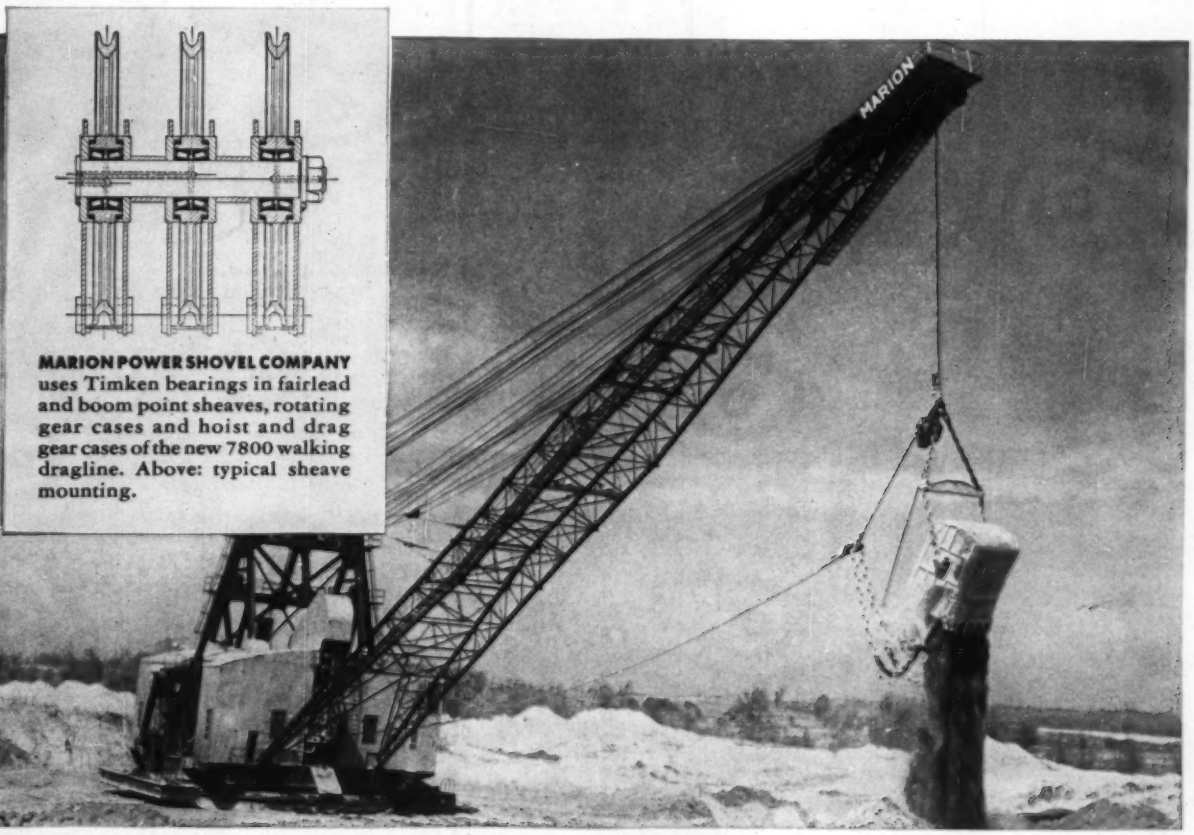

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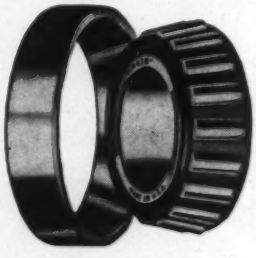

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